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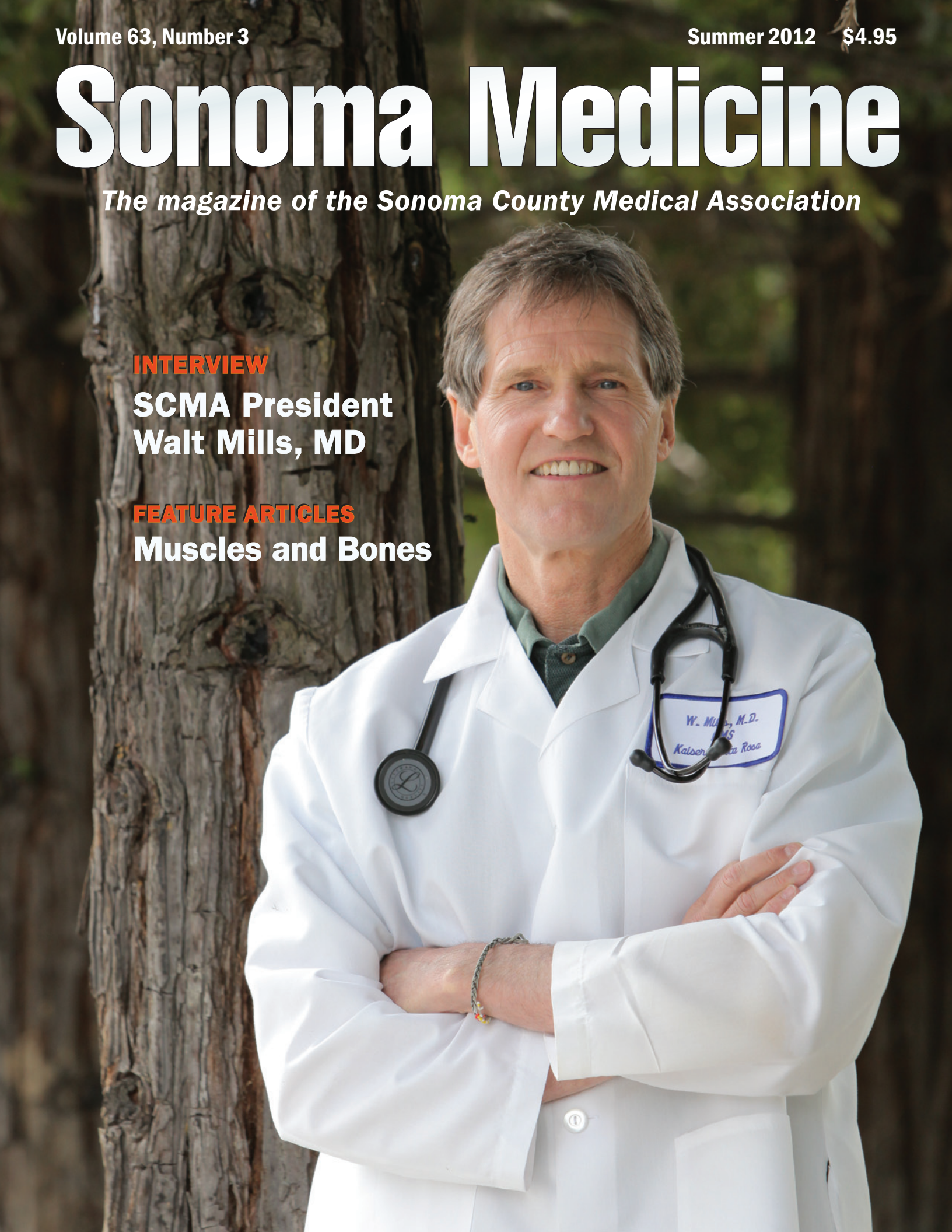
The magazine of the Sonoma County Medical Association



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SCMA President Walt Mills, MD

FEATURE ARTICLES

Muscles and Bones

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Volume 63, Number 3 Summer 2012

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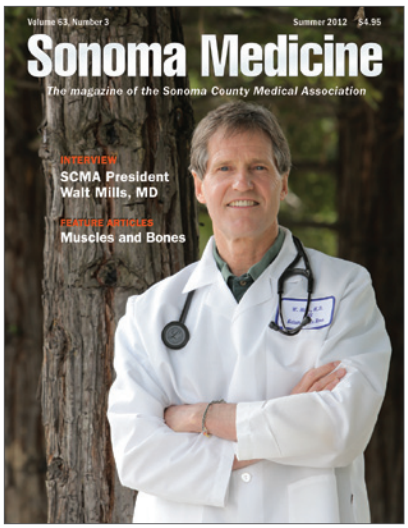

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20th Annual

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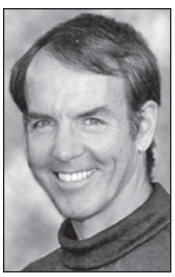
Keep On Dancing

Brien A. Seeley, MD

The orthodox view of muscle and bone is that they are simply a framework, like the studs and beams of a house. But we now know that muscles and bones are so much more—a magnificently integrated suite of capabilities and vital functions, evolved by a myriad of trials in the late Cenozoic era, each durable joint a masterpiece of innovation ideally suited to its task. Those tasks involve far more than merely the ability to move. Most advanced organisms have evolved the ability to move because it is essential to survival: to our needs for finding food and a mate, social cooperation, flight from predators, building of shelters, and peace of mind. Even language, whether via signing or from moving lips, depends upon movement to demonstrate our ability to think.

To run, jump, dance and swim are enjoyable movements that naturally animate children yet are actually a gift from our muscles and bones meant for other important, though less obvious, purposes. Such movements help maintain one's health in several important ways. In his book *Spark,* neuroscientist John Ratey explains how running can enhance not only aerobic conditioning and mood, but also learning and memory. For older adults, dancing can enhance balance and flexibility and help to avoid falls. Muscle and bone, when exercised, induce hematopoiesis by increasing circulating cytokines that command stem cells inside our bones to become new blood cells. Likewise, various forms of exercise, whether weight lifting, walking or running, performed as seldom as 3 times per week for 20 minutes, have been shown to enhance bone density regardless of age. Bone cells also release a hormone called osteocalcin, which contributes to the regulation of blood sugar and fat deposition.



Dr. Seeley, a Santa Rosa ophthalmologist, serves on the SCMA Editorial Board.

In brain injuries both large and small, whether from trauma or vascular insult, neurological deficits may be improved by prompt return to modest volitional muscle use. In such cases, deliberate use of pyramidal tract motor neurons can energize adjacent brain circuits, helping recruit neurons near the damaged areas into adaptations that overcome functional deficits. In glaucoma, a program of regular exercise can lower intraocular pressure and enhance blood flow to the optic nerve head, both welcome effects toward saving vulnerable nerve fibers from damage. Such hidden, interactive roles of muscle and bone parallel other recent discoveries in physiology, such as the finding that astrocytes, the "skeleton" of the brain, direct the physiology and growth of neurons that live in their web.

The rapid bone and muscle losses experienced by astronauts during extended weightlessness starkly emphasize the "use it or lose it" rule in physiology. Physicians should be attuned to the disuse of muscle and bone as a serious threat to long-term health. Patients need to know that using their muscles and bones can help them avoid osteoporosis, loss of strength, loss of balance, loss of memory, progressive deformities and arthritis. Life-long, age-appropriate exercise focused on preserving locomotion, flexibility and balance, and integrated with careful stretching, should be our most common prescription. And if joint disease precludes such exercise, then that joint should be repaired, rehabilitated or replaced. To soften the peak loads and prevent disabling injuries to aging joints, physicians should routinely refer elderly patients for custom fittings of well-cushioned walking or running shoes before having them embark on new exercise programs. (Local sources of custom shoe fittings include Fleet Feet, Heart & Sole Sport and SoCo Network of Care.)

If we simplistically visualize aging as attributable to stagnant capillary beds full of sludge, then muscle and bone are what enable us to purge those capillaries with freshening supplies of oxygen, glucose, reparative cells and messenger molecules.

We humans have extended our movement capabilities far beyond what our bodies can perform by inventing energy-consuming vehicles that, ironically, can cause our muscles and bones to atrophy and obesity to bloom. As we enter the future world of virtual existence—where we will be able to select better-than-real holographic experiences of every imaginable sort from our reclining chairs—only the vitality of muscle and bone will keep us from becoming mere "brains in a jar."

We have all seen how the aged rapidly dwindle once they lose their mobility. Our message needs to be: Keep moving to stay healthy. ◇

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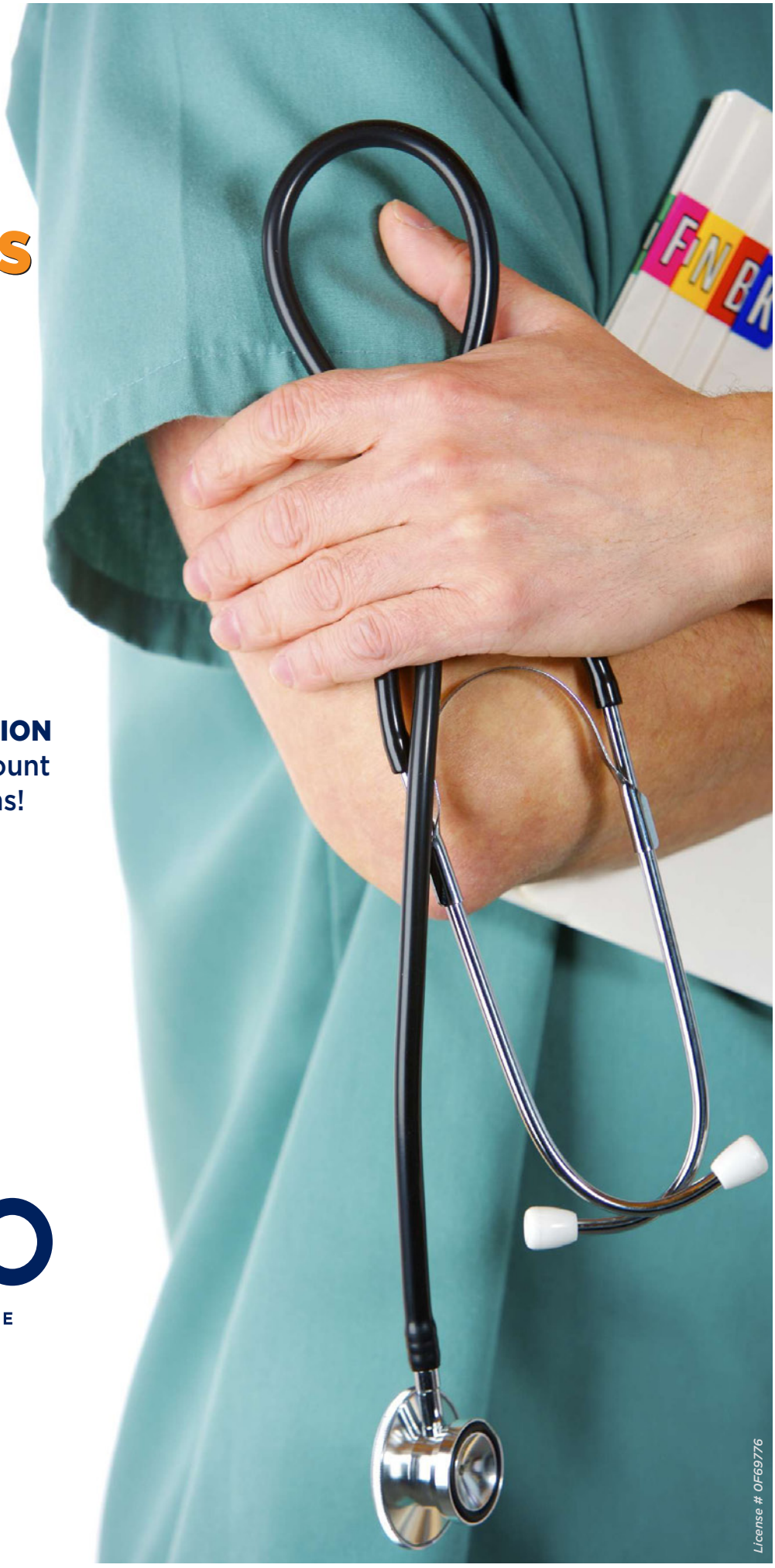

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Exercise Will Save the World

Todd Weitzenberg, MD

Exercise will save the world! Yeah, right. Perhaps this statement seems a bit boastful, naive or just ludicrous—but in fact a vast amount of scientific evidence lends support to such a claim.

The American economy continues to falter, even as the costs of health care delivery continue to escalate. A simple extrapolation quickly delineates a point at which we will no longer be able to cover our losses. Our medical system, the most costly in the world, does not provide the best medical care in the world. Our baby boomer population is aging, and the average life span is increasing. The costs of total joints, designer drugs and expensive surgical procedures continue to rise exponentially. Obesity and inactivity are a national epidemic, and the largest subset of our population becoming obese is our children. How can we possibly fix these seemingly insurmountable problems?

Our past and current solution is to dole out more pills—and if that fails, then perform surgical procedures. Physicians are taught to treat diseases with pills and scalpels: "A chance to cut is a chance to cure." Our entire fund of medical science is based on pathology. We study disease, determine where something went wrong, and then create ways to remedy the problem. We wait until it breaks, then find a fix.

Dr. Weitzenberg is a physiatrist and sports medicine specialist at Kaiser Santa Rosa.

Few would argue that if a pill could prevent diabetes, we would give it to everyone. If we had a pill that could prevent hypertension, heart disease and all-cost mortality we wouldn't hesitate to do whatever it takes to get this to our patients. If we had a pill that could decrease depression and dementia and improve learning ability, we would hand it out. We would also be sure that our friends and family, including ourselves, were hooked up with this wonder drug. Even better, what if this pill were free! We'd be elated and would create programs to ensure that everyone in our society got their fair share. Right?

Well, that pill does exist! It's exercise. It isn't a pill per se, but it can be considered medicine because of its positive cause-and-effect relationship on health and disease. Exercise can do all of the things mentioned above. A large body of well-designed scientific studies supports its powerful health benefits. There is a linear relationship between physical activity and health: those who maintain an active way of life live longer, healthier lives.[1] Exercise could similarly be considered a vaccine that can help prevent disease. If you could take a vaccine that prevents you from getting sick, would you want it? Exercise is that vaccine. Exercise will make your life both healthier and longer lasting.

I will admit my bias openly. I have been involved in exercise and sports my entire life. My parents were athletes, as were my grandparents. Exercise makes me feel better. Without it, I feel worse. To this day, I participate in sporting activities with my family and friends in my leisure time. Unfortunately this is not the case with most of our society. A recent national survey found that only 26% of U.S. adults engage in physical activity three or more times per week (defined as periods of physical activity lasting 10 minutes or more). Similarly, about 59% of adults do no physical activity at all in their leisure time. These are frightening statistics when one considers that being sedentary is a bigger risk factor for mortality than mild to moderate hypertension.[2]

All of our ancestors were early adopters in terms of exercise. Life was hard, and we evolved to meet the physical requirements necessary to survive. Only in recent times did modern society develop the means to live nutrient-rich, inactive lives, prompting the rash of chronic disease and obesity that plagues us now. At present we can work, shop, socialize and exist without ever leaving the comfy confines of our recliner. Exercise is in our DNA, yet our clever minds have continued to develop faster and more convenient ways for us to become so efficient that we just don't have the need or the time to exercise. All our advancements have created humans who live longer than ever with higher rates of chronic disease than ever before.

I became aware of the powerful medicinal properties of exercise and how it could be the solution to our healthcare

problems while listening to an amazing lecture by Dr. Robert Sallis, a sports medicine specialist, family physician and past president of the American College of Sports Medicine. Dr. Sallis has published many articles on exercise and was instrumental in the development of the "Exercise is Medicine" movement.[3,4] He also helped develop the www.exerciseismedicine.org website, which I urge you and your patients to visit. The website contains all the latest research and will help you and your patients start an exercise program. I have been fortunate to work with Dr. Sallis and have taken up the exercise crusade because I truly believe it presents a realistic means of solving our healthcare crisis.

I now give lectures about exercise at medical conferences around Northern California. The concept that exercise is good for you isn't new and is known conceptually by most people—and yet we haven't brought exercise into our culture. Physicians across all disciplines need to develop a way that we can use exercise, like medications and surgery, to fight disease. Is exercise a replacement for the many medical procedures and medications we use every day? No, of course not—but think of how we can make a difference if we start to use exercise like a medication or a procedure.

Let's start with our children. The world is now a scary place. They can't just jump on their bikes and be back when the street lights come on. Instead they play video games on HDTVs with surround sound. Plus, food is so much tastier and cheaper when you supersize it, so I'll just take another "Number 3" please and log in to my Facebook page and clear out my DVR. I'm being cynical, but this is the reality our children face. Kids these days are far more likely to watch TV or play video games motionless on a couch than get outside and play hide-and-go-seek.

Research has shown that children learn better, retain more information and have fewer disciplinary problems when they engage in exercise.[5] In my opinion, exercise is so important that it should be a required component in all educational programs, public or private. The exercise and dietary habits our children develop generally will be carried with them throughout their lives. Now more than ever we need to be advocating for physical education and sports programs for our children. The devastating effects that occur from the chronic disease of childhood obesity can no longer be ignored. We need to teach our children the power of exercise so they can live healthier, more productive lives.

Getting our older patients to exercise will also be a challenge. By age 60, 100% of us will have some form of osteoarthritis. The humbling reality of being a bipedal organism in a strong gravitational field is that we weren't engineered to last this long. The good news is that even in the presence of significant osteoarthritis and rheumatoid arthritis, exercise is the best medicine. A high-intensity progressive resistance exercise program for patients with rheumatoid arthritis was shown to improve walking times and balance while decreasing fatigue, with no increase in pain or swollen joints.[6] Sometimes you need to work on creative solutions, such as low-impact exercise on a stationary bike or pool therapy, but exercise will often have more success in managing arthritic joints over the long term than medications or cortisone injections. Did you ask your patient about their exercise habits before you prescribed those anti-inflammatories or gave them their last cortisone injection?

Living in today's fast-paced society can be stressful, and the rate of depression is at an all-time high. Fear not! Research has also shown that depression is treated better by exercise than by antidepressant medications.[7] When treating depression, how often do we discuss exercise instead of instinctively reaching for our prescription pads?

The reality of the situation is that "exercise as medicine" isn't in our consciousness, but it needs to be. During my medical school, residency and fellowship training, the concept of exercise as medicine was never discussed. Exercise as medicine needs to be a component of all medical training. We need to think of all the ways that depression and chronic disease can be prevented by the powerful effects of exercise, instead of waiting for something to go wrong and then chasing our tails trying to fix it. Of course there are many factors at play, but as physicians our collective voice can effect change. Exercise is something you should think about in every clinical encounter. Just as we are trained to ask about smoking, ask your patients about their exercise habits. Your asking makes the subject important, and your patients will appreciate your efforts.

Currently you are more likely to get authorization for an expensive gastric bypass procedure than for an exercise consultation by a certified health professional. Why does our system cover often life-threatening procedures, yet not invest in physical education programs? I don't think it's because we don't care, but rather because that's the way it has always been. Now, however, the stakes are too high, the price tag too big, and the consequences potentially catastrophic. We can't wait until someone becomes so big that we have to restrict their alimentary canals. We need to encourage them to exercise so that such a radical procedure should never have to be considered.

I'd like to see the way we study medicine evolve. Imagine if we spent as much time studying the people who eat right and exercise instead of just studying the infirm and corpses. What if we studied people like the friend of mine who is out riding Levi's Gran Fondo at 75 years old, with faster times than others half his age? Instead of pathology, I suggest we start a "lifeology" discipline and create an entire branch of medicine on the powerful preventive effects of exercise. Just as we need to continue developing solutions to cancer and other complex medical problems, we should develop ways to prevent people from falling into the trap of becoming sedentary and developing chronic disease.

Exercise has been clinically proven to help prevent chronic disease and give people happier, healthier lives. Yet, how will it save the world? It starts with us. The physicians of our community need to collectively prescribe exercise to all our patients. More importantly, it starts with you. How much time are you taking to get the necessary minimum exercise requirements of 30 minutes, five days a week? You need to make the time to exercise daily for your own well-being so you can continue to be a dedicated physician for your patients for many years to come. You will feel better about yourself and can prevent the development of chronic diseases that could potentially afflict you. You will also be sending a message to your staff and your patients that exercise is important.

Encourage your staff to exercise. Support them in their efforts to walk on their breaks and to participate in events that will make them more active. Most important, talk to your patients. Ask them how much they exercise, and encourage them to do more. Discuss the powerful effects of exercise and how it can prevent them from getting sick and make them healthier. Congratulate them when they are more active. Before you start writing your next prescription for a medication, ask yourself if you have thought about exercise and the role it will play in your patient's care.

We became physicians because we wanted to make a difference in peoples' lives. With advancing technology and the pressures of a modern medical practice, we can easily lose sight of this mission. Exercise can help us make a difference in not only our own lives, but also the lives of our families and friends and the members of the community we serve. If physicians can spread the message and prescribe exercise to those around us, we will make their lives better, healthier and happier—which will ultimately make our community a better place. If everyone joins in, we might even save the world! ◇

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Techniques for Accurate Diagnosis of Musculoskeletal Injury

Ty Affleck, MD

Earlier this spring, the public relations department at the San Francisco Giants went into overdrive after one of their poster boys—relief pitcher Brian Wilson—suffered a season-ending injury to his elbow. Wilson had reinjured the ulnar collateral ligament of his throwing arm and would likely need a second reconstructive surgery.

Like many professional baseball players with an elbow or shoulder injury, Wilson sought the guidance of Dr. James Andrews, a widely known sports medicine orthopedist. Dr. Andrews has often been in the news, not only for his surgical care of professional athletes, but also because of his recent stand against the overuse of magnetic resonance imaging in orthopedics. He has gone on record stating that MRIs are not only vastly overused, but also easily misinterpreted, often resulting in misdiagnosis and unnecessary and even harmful treatments.[1]

As a primary care sports medicine physician, this kind of information reinforces my long-held belief that the physical exam should guide a clinician more than a radiology report. Unfortunately, musculoskeletal training is significantly lacking in most primary care residencies, often relegated to a few cursory hours in an orthopedic surgeon's office. With 15% to 30% of visits to a primary care office centering around musculoskeletal injury and pain, accurate diagnostic skills and appropriate rehabilitative counseling should become a greater priority in residency training and medical schools. Unfortunately, this has yet to happen. Recently, third-year medical students polled at Harvard University felt not only low confidence in performing a musculoskeletal exam, but also failed to demonstrate cognitive mastery in their musculoskeletal medicine exams—passing at a dismal rate of only 7%.[2]

Dr. Affleck is a Santa Rosa family physician and sports medicine specialist, and the team physician for both Santa Rosa Junior College and Sonoma State University.

Using your hands to find changes in tissues that have undergone trauma is a learned skill that requires repetitive application but enables accurate diagnosis. By placing your hands on top of each other and using the upper hand to apply pressure while keeping the lower hand relaxed, much more information can be gained in simple palpation than by using single-handed pressure. Care must be taken to control for rotation when doing ligamentous tests around joints, but repetitive joint examination builds confidence and skill, allowing accurate determination between normal joint stability and abnormal joint laxity. Much can be learned from time spent with the physical and massage therapists who use their hands all day on various tissues, both diagnostically and therapeutically. The key to accurate diagnosis in the sports medicine office is similar, combining tactile sense, biomechanics, mechanism of injury, and knowledge of anatomy.

Pain from musculoskeletal injury is generated by nociceptive receptors from tissues bruised or broken, partially or completely torn, or chronically overused. Pinpointing these areas with fingertip palpation—combined with information on depth, consistency and sensitivity—helps determine the extent and severity of the injury. Palpatory sensitivity to the scarring that binds tissues and consolidates different layers of tissue helps determine the proper course of treatment.

Stability testing across joints helps diagnose ligamentous injury and endpoint stability, and sensitivity determines partial or complete tearing of tissues. Consistency of tissues on palpation helps determine the amount of edematous inflammation, hematoma formation and chronic fibrosis present. Repetitive tactile information gained using your hands as diagnostic tools helps sharpen your technique, further enhancing your diagnostic acumen. Learning and understanding anatomy in the region of palpation is paramount in knowing which tissues are actually injured.

Biomechanics at the time of injury and in evaluating these injured tissues lets you choose between passive and active resistance tests to confirm the

tissues' involvement in injury and the severity of that involvement. Activating concentric and eccentric muscles surrounding the injury helps you evaluate the extent of injury. Several physicians have their names recorded in infamy for designing various musculoskeletal tests to check for inflammation, injury, impingement or dysfunction. Recognizing the biomechanics involved with injury helps you reproduce each of these tests without necessarily committing them all to memory.

When an actual diagnosis is in doubt, or surgical correction is likely, MRI studies can be of benefit. As a sensitive test, MRI should augment the physical exam and reinforce your diagnosis—not necessarily supersede it. The best use of an MRI is in the decision-making process, helping guide between two possible treatment options.[3] Care must be taken when evaluating MRI findings because of the high percentage of false positives. In a recent study of healthy asymptomatic professional baseball pitchers by Dr. Andrews, shoulder cartilage abnormalities were noted in 90% of all study participants, and rotator cuff tendon abnormalities were present in 87%.[1]

When a musculoskeletal injury appears in your office, use your hands. Find the location and character of the injury, and the response to stretch and muscle activation stresses. Look for nerve and bone involvement in addition to ligament, tendon and muscle involvement. Use your anatomy background to determine the areas of the musculotendinous junction, tendon and ligament periosteal attachment, and areas of typical nerve impingement. If you need further imaging or diagnostic testing, order wisely to help you make a decision on treatment, or to confirm your suspicions of injury. Trust what you feel. Remember, your fingers can do the walking.

Fortunately, relief pitcher Sergio Romo's beard has filled in nicely, resembling Brian Wilson's now famous countenance, and the Giants' public relations crew has stepped up with several new promotions as alternatives to "Fear the beard." I'm still waiting for Tommy John Surgery Day, but I don't think it will happen. Perhaps I'll see you at the ballpark on Orange Buster Posey T-Shirt Night. ◇

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Diagnosing and Treating Concussions

Robert Nied, MD

In May, Junior Seau—one of the greatest football players of his generation—took a gun and shot himself in the chest. He was just 43 years old. His friends and family blamed his suicide on the accumulated toll of repeated concussions.

Seven days a week, Google Alerts fills my smartphone with new concussion-related links and press releases. Most concern injuries to professional athletes, but there are also stories of high school careers derailed, new findings on the severity and long-term consequences of concussion, and reports on new or pending legislation. Indeed, nearly every state legislature in the country is racing to enact laws protecting kids from concussions; and for good reason. The Centers for Disease Control estimates that 1.6 to 3.8 million concussions occur annually in sports and recreational activities.[1]

Up to 20% of high school football players will have symptoms of a concussion in a given season. This is not surprising, given that the average player gets over 1,000 subconcussive blows in excess of 20 Gs per season.[2,3] As many as 90% of concussions go undiagnosed and untreated, although this number is declining with increased awareness of the condition, along with growing acceptance among athletes that a concussion is a legitimate injury.[1] In a sign of the times, pediatric ED visits for head injury increased almost 100% between 1995 and 2007.[4]

Dr. Nied is a family physician and sports medicine specialist at Kaiser Santa Rosa.

Case Study

Marisa is a 16-year-old club soccer player who collided with another player while attempting to head the ball and was knocked to the ground. She doesn't remember the moments following the collision. Initially she had a headache, dizziness and a feeling she was "in a fog." She did not vomit. By the time she presents to your office two days later, her symptoms have nearly resolved, although she still is having some trouble concentrating.

What grade of concussion did she have? What should you include in your initial evaluation? What are your initial treatment recommendations? When can she return to play?

What is a concussion?

Concussion is currently defined as a "complex pathophysiologic process affecting the brain" resulting from either a direct or transmitted blow to the head and a having a lack of abnormalities on standard structural neuroimaging.[5] Recent advances in neuroimaging, such as fMRI, along with the identification of serum and CSF biomarkers of traumatic brain injury, have yielded insights into the cellular processes of concussion. At present, however, there is no reliable biochemical marker for traumatic brain injury, and advanced imaging technologies are mostly limited to the research setting. As such, a concussion remains primarily a clinical diagnosis based on typical symptoms in the context of a head injury.

For the front-line clinician, perhaps the most important change in the current definition of concussion is the abandonment of the traditional graded concussion paradigm because of the complex and variable nature of individual symptoms and outcomes. In other words, a patient simply either has a concussion or not.

What should your initial evaluation include?

Marisa's initial evaluation should include a symptom inventory (see sidebar below). More symptoms across more domains generally correlate with a more significant injury. A recent study looking at subtle injury patterns on DTI (an advanced MRI modality) has suggested a correlation between the location of brain injury and the symptom complex the athlete experiences.[6] Loss of consciousness less than a few minutes, though dramatic, seems to have little predictive value for the severity of the concussion or long-term consequences.

Concussive Symptoms

Physical
- seizure
- headache
- dizzy/vertigo
- nausea
- balance

Loss of Consciousness

Amnesia
- anterograde
- retrograde

Cognitive
- confusion
- poor concentration
- inability to process new information

Somatic
- emotional/irritability
- sleepiness or fatigue

Your physical exam of Marisa should focus primarily on signs and symptoms of skull fracture and intra-cranial bleeding; if present, consider a head CT scan. You should assess her balance—loss of balance is an objective finding in some concussed athletes. In our office we use the Balance Error Scoring System (BESS), a simple and quick test which can be done by any physician. Finally, you should evaluate her cognitive function. The simplest option is using the Sideline Concussion Assessment Tool 2 (SCAT2). Both the BESS and SCAT2 can be found in the Zurich Guidelines.[5]

More advanced testing can be done using neuropsychological testing (see below), but this may not be necessary. At Kaiser Permanente, we have adapted the SCAT2 to our electronic medical record and are evaluating best practices for its inclusion in the primary care office setting.

Marisa's exam demonstrates no focal neurologic deficit. She has no increase in her symptoms with exertion or deficits to balance testing. Based on her history, symptoms and physical exam, we can conclude that Marisa had a concussion.

What is your initial treatment plan?

The mainstay of treatment for a concussion remains brain rest. Although exertion clearly increases concussion symptoms, there is little evidence that the injury actually resolves faster with rest, or what amount of rest is most beneficial.[7] A recent observational study reported significant benefits, even months after the injury occurred, with a week of "total rest" (including no TV, computer or telephone use).[8] Athletes and coaches usually understand the need for physical rest, but physicians should actively prescribe cognitive rest as well. There are standardized templates describing a "return to school" protocol available from the CDC and others.[1]

For the majority of concussed athletes, rest is all that is required. For prolonged symptoms lasting more than 3–6 weeks, other treatments may be considered. Vestibular rehabilitation may help persistent balance and vertigo symptoms. Tricyclic antidepressants and amantadine are often employed for prolonged headache and sleep disturbance. High dose (2–4 grams a day) Omega 3 essential fatty acid supplements have been suggested as an active treatment for axonal healing.[9] Clinical outcome studies in humans, however, are lacking. There is a significant overlap between the symptoms of a prolonged concussion and common mood disorders such as depression. The use of SSRI antidepressants may be helpful, but coordination with a behavioral medicine specialist is recommended.

What about neuropsychological testing?

Neuropsychological (NP) testing has long been used both in research and clinical treatment of concussion and other traumatic brain injury. The advent of computer-based testing has made it available for routine use in the training room and office (see sidebar on ImPACT testing). Although not universally accepted or shown to actually improve outcomes, NP testing can help identify a subset of athletes with demonstrable cognitive defects even after self-reported symptomatic recovery.[5]Aside from cost, the primary limitation of NP testing is the need for baseline measurements.

How long should Marisa rest?

The typical concussion in an adult lasts about a week, with physical symptoms lasting a few days and NP testing returning to baseline in about a week. Recent studies using NP testing have shown that teens take about twice as long, with younger and female athletes taking the longest to return to baseline status.[10,11] Changes on MR spectroscopy take months to resolve. Diffusion tensor imaging (an advanced MRI technique which detects subtle brain injury by measuring the direction of water diffusion in white matter) has demonstrated injury pattern changes years after injury, although the clinical significance of this is unknown.[12]

Individual recovery, however, is highly variable and unpredictable. Sidney Crosby, despite the pressure of being the most recognizable hockey player in the world, sat out of competition for nearly a year. Prolonged symptoms of post-concussion syndrome are fairly common, affecting up to 20% of athletes. There is also a correlation with pre-existing mood disorder, migraines and learning disability. Some evidence suggests that initial anterograde amnesia and balance impairment are the symptoms most closely associated with a longer recovery.[13]

ImPACT Testing

ImPACT is a computer-based neurocognitive test that can be administered by doctors, psychologists, school nurses, athletic trainers or other qualified personnel who complete the necessary training. Among other functions, the 30–40 minute ImPACT test measures attention span, working memory, sustained and selective attention time, response variability, non-verbal problem solving, and reaction time.

Ideally, ImPACT should be administered to establish a baseline screen for athletes before the season begins, but it can be used regardless of baseline to help evaluate cognitive deficits after a concussion. Whenever an athlete appears to sustain a concussion during the season, he or she is pulled from play, evaluated, and if necessary sent to a physician or other professional certified by ImPACT for clinical assessment and specialty care. The ImPACT test is then readministered, and the results are used to determine the extent of the concussion and to help with the treatment plan.

Locally, ImPACT testing has been implemented at both Santa Rosa Junior College and Sonoma State University. Dr. Ty Affleck, a certified ImPACT concussion specialist and team physician for both schools, hopes to implement the testing in local high schools in the near future.

—Steve Osborn

For Marisa, absent a baseline NP test, we'll prescribe complete physical rest until asymptomatic and then a graded return to school and play while monitoring for the return of symptoms.

Is Marisa at risk for another concussion?

There is a generally recognized period of increased vulnerability for a repeat concussion. The second concussion tends to be more symptomatic, longer lasting, and to result from a lesser impact than the initial injury. Retrospective and animal model studies suggest a "window of vulnerability" lasting less than a week, but with a four- to six-fold increase in likelihood of concussion. It is unknown if the resolution of reported symptoms or deficits on NP testing predict the closing of this window of vulnerability.

Although the NFL has begun to take concussion history into account in evaluating draft prospects, it is unknown if there is a genetically determined "concussion threshold" or predisposition. We have known for decades that the APOe4 allele is associated with boxers developing dementia pugilistica (punch drunk syndrome). Recent studies have suggested that it may also identify a subset of individuals at risk for more severe consequences of sports-related concussion injury.[5,14]

What about the bad stuff?

The much publicized and feared "second impact syndrome," in which a repeated concussion during the recovery process results in sudden death, is actually an exceedingly rare event. It is estimated to occur once per every 5,000 team seasons in American football. It is most likely a subset of malignant brain edema, a previously recognized entity with a genetic predisposition, and not truly a consequence of a repeat concussion. Even if NP testing could prevent second impact syndrome by stopping premature return to play, it would take an estimated 18 million baseline tests to prevent one case.[15]

Much attention has been given recently to chronic traumatic encephalopathy (CTE), following the discovery of large abnormal accumulations of Tau protein in the autopsied brains of former football players. As with many other medical conditions, however, there is a difference between association and cause and effect. Why repeated trauma might lead to CTE and whether and how those changes lead to clinical symptoms remain unanswered questions. Indeed, earlier this year a CDC study looking at death rates of almost 3,500 retired NFL players found lower than expected death rates and suicides.[16] Others have pointed to the known associations between chronic pain, depression and substance abuse in former athletes as confounding variables.[17]

What about the effects of heading on our soccer-playing patient?

Girls' soccer is second only to football in the risk of suffering a concussive head injury. Eighty-six percent of soccer-related concussions are related to the act of heading, but most of these are collisions in the course of play, e.g., head-to-head, head-to-ground.[18] A widely publicized recent study reported that heading the ball more than 1,000–1,500 x/year was associated with changes on fMRI resembling minor traumatic brain injury, as well as lower scores on NP testing vs. age-matched peers.[19] But the number was small (n=38), and other retrospective studies of the long-term effects of heading the ball are conflicting.[20] For now, a reasonable approach may be to delay heading until skeletal maturity, to limit unnecessary heading in practice, and to teach excellent fundamental technique.

Can concussions be prevented?

Helmets, which are designed for and do a remarkably good job of preventing skull fractures, do not prevent concussions.[21] Indeed they may be part of the problem. The late Joe Paterno famously said that the way to prevent concussions was to take away helmets—then players would not hit with their heads. Similarly, mouth guards only prevent dental injury.[22] There is no current evidence that soccer headgear products can reduce the incidence or severity of concussions.[23]

Lesser neck strength relative to head size has been postulated as the reason for increased incidence in younger and female athletes. Several small studies, however, have failed to show that neck-strengthening exercises result in fewer head injuries.[24]

The most effective systemic way to prevent concussions is through rules changes. In the early 1900s, President Theodore Roosevelt threatened to ban college football after a rash of deaths due to head injuries. Instead, the flying wedge was banned and the NCAA was born. More recently, outlawing spear tackling dramatically reduced the risk of spinal-cord injury in football. "No hitting" leagues have been established in youth hockey, and I expect we will see further rules changes in other contact sports.

What does this mean for Sonoma County?

Earlier this year, California became the 42nd state to enact concussion legislation for high school athletes. The new law requires high school athletes suspected of having a concussion be removed from play and not returned to competition until they are cleared by a medical professional trained in the management of concussion. (Interestingly, this is a broader statement than existing California Interscholastic Federation regulations, which specifically require that athletes be cleared by a physician.) Additional pending state legislation stipulates the specifics of mandatory annual training for coaches and athletes. Clearly we will be seeing more patients.

Local communities are beginning to assemble the patchwork of health resources so that all young athletes have access to concussion education and care. For example, the mission of the Northern California Concussion Coalition (NCCC) is "to work in partnership to provide student athletes in the community with the best-in-class resources available to protect them from concussions in sports." Physicians from

UC Davis, Sutter Health, Mercy, and Kaiser Permanente have already formed a similar concussion coalition in partnership with the Play It Safe program in the Sacramento area, and we hope to develop a similar program here.

What will NCCC, Play It Safe and similar programs mean for an athlete like Marisa? The hope is that Marisa can play on a team in which her coach is aware of and watching out for concussions. That Marisa's parents and teachers understand and respect her need for brain rest following an injury. That her teammates support her recovery even though it is a silent injury. That Marisa herself understands the importance of not "playing through" her injury, and that she receives care from a physician who makes an informed diagnosis and initial treatment plan. And perhaps most important—that she has access to a network of sports medicine specialists and others in the community as needed regardless of her health plan or insurance status. ◇

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Recent Advances in Total Joint Replacement

Michael Star, MD

Total joint replacement is one of the most successful contemporary surgical procedures. Refined surgical techniques, improved implant characteristics, aggressive physical rehabilitation and a focus on pain management have all contributed to this achievement. The long-term success rates for total hip and total knee surgery currently exceed 95%.[1,2]

About 200,000 total hip replacements and 450,000 total knee replacements are performed in the United States each year. By 2030, according to estimates, those numbers will grow to 600,000 hip replacements and 3 million knee replacements.[1]

At this time, most total hip procedures use non-cemented porous ingrowth femur and acetabular components, where a rough or porous surface allows bone to grow in to secure the metal prosthesis. For osteoporotic patients, however, the femoral stem may need to be securely fixed to bone with a cementing technique. Because of the different skeletal anatomy of the knee, most knee replacements are cemented, regardless of patient type. The most common articulating surface in both hip and knee replacements is a surgical grade cobalt-chromium alloy, rotating or gliding on a specially formed ultra-high-molecular-weight polyethylene surface.[2]

Historically, the ideal patient for total joint arthroplasty was a thin, older individual with a sedentary lifestyle. These patient characteristics created less mechanical stress on the implant and could allow the prosthesis to function for the lifetime of the patient without need for revision. Studies had shown that younger, more active, and heavier patients had a higher failure rate.

Changing expectations have significantly altered the patient demographics in total joint replacement. Younger patients who want to continue their active lifestyle are now requesting the surgery. Likewise, overweight patients and those with comorbidities, who would have been rejected in the past because of high risk, are now expecting relief of their symptoms.

While the long-term results of joint replacement surgery are excellent, the changes in patient demographics mandate further research into optimizing results and diminishing surgical and medical complications. Replacing living human joints with artificial metals and plastics is an ongoing technical challenge.

The most common mode of failure has been polyethylene wear, with wear debris resulting in osteolysis and loosening. However, recent improvements in the manufacturing of polyethylene, including cross-linking and oxygen-free sterilization, have made the material more durable and longer-lasting.

For total hip replacements, metal-on-metal bearings have been used since the 1990s, with significantly increased use in the last decade. While most of these implants have had good results, some have loosened from their bond to bone. These failures led to a highly publicized recall and to the recent decreased use of metal-on-metal implants.

Another bearing surface in total hip replacement, ceramic articulation, has been used for about 40 years.[3] Initial results were suboptimal, although improved manufacturing techniques give these prostheses extremely low wear rates and low rates of osteolysis. Clinical results are good, though some ceramic hip bearings have audible squeaking. The squeaks occur in certain hip positions in walking, squatting or climbing stairs, and they may be related to component positioning, which may also cause increased wear.

Taking all these factors into account, the most commonly used articulation, with the most extensive clinical follow-up for hip and knee arthroplasty, remains metal on contemporary polyethylene.

In addition to new materials, new surgical techniques have been developed

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in an attempt to improve results for hip and knee arthroplasty. As always, the potential benefits of new techniques and technology need to be weighed against increased risk, operative time and blood loss.

Minimally invasive surgery has the theoretical advantages of less blood loss and quicker recovery. Unfortunately, there is little scientific evidence for improved recovery or clinical result, and some studies have even documented an increased complication rate with minimal-incision techniques.[4] Computer-assisted implant surgery is another alternative, but again studies have failed to show consistently improved radiographic outcomes, and clinical improvement has not been clearly documented.[5]

In light of the above, meticulous surgical practice using accepted techniques and proven implants is still the mainstay of successful arthroplasty surgery. Of course, satisfactory results following total joint arthroplasty depend upon minimizing medical complications. In a database review, the 90-day mortality following total hip replacement was 0.68%.[6] The most common implant-related complication was dislocation, and the most significant medical complications were infection and venous thromboembolism. Patient-related risk factors included diabetes, rheumatoid arthritis, increased age and increased Charlson comorbidity score.

The most recent meeting of the American Association of Hip and Knee Surgeons, which I attended, included extensive discussions of the risks and effects of medical complications. Several papers published in the Proceedings addressed the common difficulty of diagnosing infections in post-surgical total joints.[7] Schwartz et al reiterated the use of erythrocyte sedimentation rate, C-reactive protein and synovial fluid white blood cell count, particularly in knee arthroplasty. Wetters et al found leukocyte esterase reagent strips, commonly used for diagnosis of urinary tract infection, helpful for diagnosing infected joint fluid. Cashman et al also found joint-fluid C-reactive protein helpful in diagnosing infected joints. Toossi et al, however, found no benefit in serum white blood cell count in making the diagnosis of an infected total joint.

Morbid obesity has been associated with poor results in total joint replacement. A survey of hip and knee surgeons found that more than 80% discouraged joint replacements because of obesity. Almost 40% referred a total joint replacement candidate to a bariatric program. Similarly, 45% deferred or canceled surgery because of an elevated hemoglobin A1c, the marker of diabetic control.

The importance of identifying and preoperatively addressing other medical comorbidities was discussed at length. Ong et al emphasized the importance of a preoperative risk stratification to decrease renal, pulmonary, mental and cardiac complications. D'Apuzzo et al demonstrated the association between obstructive sleep apnea with increased mortality and morbidity, including pulmonary embolism and wound problems. They recommend preoperative screening and appropriate monitoring and treatment. Romine et al discussed a risk calculator for a total knee arthroplasty. Factors associated with increased risk included hyperkalemia, bilateral procedures, males and increased age. Restrepo et al found that preoperative anemia was associated with increased hospital stay, infection and mortality. Finally, Berend et al described a three-fold increase in failure rates in hip replacements in smokers.

While the success of joint replacement surgery has been extensively documented, changing patient demographics and a low but defined rate of complications mandate continuing study and investigation to optimize surgical and medical results. The orthopedic community is becoming increasingly aware of the importance of appropriately identifying and managing medical comorbidities. ◇

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Identifying and Treating Osteoporosis

Jerome Minkoff, MD

Osteoporosis is a bone disease that leads to increased risk of fractures. Although the disease mainly affects Asian and Caucasian women, Hispanic and black women are also at risk, tending to fracture later in life, possibly due to higher adult bone density. Men also suffer fractures, increasing with age, but their rate tends to lag behind that for women by about 10 years. The proportion of men with osteoporosis is about one-third that of women, partly because men do not live as long as women. However, the rate of low bone mineral density (BMD) is similar for both men and women. Thus, a high percentage of both men and women have osteoporosis or are at potentially increased risk for fracture: more than 40% of women over 50 years of age will break a bone because of osteoporosis.

Osteoporosis can be diagnosed by measuring BMD with dual-energy X-ray absorptiometry (DEXA), but clinically any history of fractures should prompt physicians and other health care providers to screen, counsel and treat patients at risk. Bone density is usually reported compared to peak bone density. An individual BMD that is 2.5 standard deviations below the mean BMD for a 30-year-old is considered osteoporosis.

Dr. Minkoff is an endocrinologist at Kaiser Santa Rosa with a special medical interest in osteoporosis.

Bone density and strength increases through childhood and adolescence, peaking around age 25–35 in men and women. Population studies and individual follow-up show a decline in BMD after that age. The decline can accelerate with loss of sex hormones (estrogen in women and testosterone in men). In the decade after menopause, some women lose 10–20% of their bone mass, and their fractures subsequently increase.

A skeletal fracture due to osteoporosis can seriously impact quality of life. In addition to the acute pain, chronic debility can occur with all types of osteoporotic fractures. Forearm fractures may cause deformities and loss of wrist and arm function; vertebral factures can lead to height loss, chronic back pain and decreased respiratory capacity; and hip fractures, in particular, often lead to severe limitations of function, resulting in loss of mobility and independence. Hip fractures are highly morbid events, with a mortality rate at one year of over 20%. One-third of these patients will be permanently disabled, and over 80% will be unable to carry out at least one activity of daily living. Osteoporotic fractures can also be expensive, resulting in direct medical costs estimated at $50 billion by 2040 as the baby boomers pass their 80th birthdays.

Prevention and Risk Assessment

Preventing osteoporosis requires good nutrition with adequate calcium and vitamin D intake. Weight-bearing exercise can enhance bone density, prevent bone loss and possibly decrease fractures. Avoiding excess alcohol and being tobacco-free encourages normal bone metabolism. Anything that decreases sex hormones will cause bone loss in men and women. Other major risks for bone loss and fracture include medications such as corticosteroids; diseases, such as type 1 diabetes; rheumatoid arthritis and other connective tissue diseases; and bowel disease (including bariatric surgery), which can reduce dietary calcium absorption. Lupron therapy for men with prostate cancer as well as young women with endometriosis can cause rapid bone loss. Even Depo-Provera or other causes of amenorrhea will lead to decreased estrogen and bone loss.

Although every adult as they age is at risk for losing bone mass, a prior history of fracture, low BMD and advanced age are the three most important risks for predicting which individuals are at highest risk for fractures. Other risks include a family history of hip fractures, low body weight, smoking and excessive alcohol. Understanding all the various factors that may increase a person's risk for fractures is challenging, as some risks are more serious than others. Incorporating these various risk factors into a clinically useful tool, the World Health Organization and the National Osteoporosis Foundation have developed FRAX, an online osteoporosis risk calculator.[1] Clinicians and

patients can use this tool to determine an individual patient's absolute 10-year risk for major osteoporotic fracture and hip fracture. I use this tool to discuss risk with patients.

In assessing risk for fracture, the history and physical exam give us important information. A history of fracture after age 45 and a family history of osteoporotic fractures increase risk for future fractures. Excess alcohol intake, current smoking and poor vision increase fracture risk. Deconditioning, poor balance and sedating medications all increase fall risk and fractures.

On physical exam, low weight and weight loss are associated with increased fracture risk. More than 2 inches of height loss or increased dorsal kyphosis may indicate possible vertebral fractures. Orthostatic hypotension, neuromuscular dysfunction, difficulty standing from a sitting position, or evidence of poor coordination or balance are obvious risks for falls.

Routine laboratory testing should include TSH to screen for hyperthyroidism and Calcium to screen for primary hyperparathyroidism. CBC and testing for hepatic disease and renal insufficiency are reasonable. Lateral chest X-ray or thoracic spine film are warranted if vertebral compression fracture is suspected.

Calcium and Vitamin D

Adequate intake of calcium and vitamin D is the mainstay of osteoporosis prevention. Although the minimum daily requirement of elemental calcium for men and women is 1,500 mg in adolescence and senescence, most women do not achieve that level once they enter puberty. Avoidance of dairy products may partially account for lower peak BMD and increased susceptibility to fractures. When recommending calcium supplementation, be aware of the amount of elemental calcium, as various salts have more calcium per total weight. CaCO3 is 40% calcium, for example, whereas calcium lactate is 10% calcium.

To be effectively absorbed, calcium must be dissociated from the accompanying anion. CaCO3 is best absorbed when the acid tide is greatest—about 1 hour after eating. In a low-acid environment (e.g., patients with atrophic gastritis or those taking PPIs), CaCO3 will not dissociate, and absorption will be poor. For this reason , calcium citrate may be a better choice in certain populations.

Various calculators can help patients determine how much calcium they get in their diet. Most Americans need 500-1,000 mg supplemental calcium daily. Total daily intake of calcium is recommended for all pre- or post-menopausal women and older men (1,000 mg/day for premenopausal women; 1,200-1,500 mg/day for postmenopausal women and men over age 50). But save the coral reef—there is no increased benefit from "coral calcium." Although recent studies have shown possible increased cardiovascular risk from calcium supplements, the benefits of adequate calcium and D are not in question.

Adequate vitamin D is essential for calcium absorption and muscle metabolism. Since 1-hydroxylase decreases with decreasing renal mass and function during normal aging, older adults need to maintain adequate 25-OH vitamin D levels. This requires 400-800 IU daily in most adults, but that number can vary with age, obesity and bowel function. Studies suggest benefit from vitamin D supplementation in preventing falls and osteoporotic fractures. By just giving calcium and vitamin D to older adults, researchers in France were able to show a 43% decrease in hip fractures over an 18-month period.[2]

As vitamin D levels decrease, parathyroid hormone levels increase. In my experience, secondary hyperparathyroidism can persist despite replenishing vitamin D. The persistent stimulation of osteoclastic resorption of bone can outstrip the osteoblasts' ability to lay down new bone. This imbalance may worsen bone loss in postmenopausal osteoporosis.

Medications

In women, treatment of hypogonadism (e.g. menopause) with estrogens forestalls bone loss and increases bone density over the first 3-5 years of treatment. Men with hypogonadism who are treated with testosterone have similar benefits. In fact, all the FDA-approved medications for osteoporosis have similar effects on bone density and fracture prevention. These medications include selective estrogen receptor modulators, such as tamoxifen and raloxifene; calcitonin nasal spray; bisphosphonates, such as alendronate, risedronate, ibandronate and zoledronic acid; and denosumab. They all suppress osteoclastic bone resorption and are referred to as anti-resorptive agents.

Since the skeleton "turns over" every 2–4 years, most antiresorptive medications have their peak improvement in bone density in that time frame. As excess osteoclastic function is decreased by these medications, the osteoblasts refill the bone remodeling space, increasing bone density and decreasing fracture risk.

Urinary N-telopeptide, which is derived from the type 1 collagen unique to bone, is a marker of resorption. Bone formation markers, such as osteocalcin and serum bone-specific alkaline phosphatase, can also be followed, but the clinical interpretation is best left to endocrinologists and specialists in the field. Our dental colleagues want to know bone turnover markers before invasive procedures because osteonecrosis of the jaw in patients taking bisphosphonates has become a concern.

Recombinant human PTH can increase osteoblastic function and bone production. Its use is limited to 2 years, however, and after it is stopped an antiresorptive agent is required to preserve the gains made in bone density and strength.

Identification and Treatment

How are we at identifying osteoporotic patients and treating those at high risk of fracture?

In one academic study of 934 women over 60 years old, fewer than 20% who had fractures on chest X-rays had it mentioned on their discharge summary, and fewer than 5% received

treatment.[3] In a Canadian study (an integrated system where there is no theoretical barrier to care due to cost), the vast majority of fracture patients never had calcium, vitamin D, DEXA or medications suggested.[4]

We can do better. By using a system for finding fracture patients (women over 65 with fracture), Kaiser Santa Rosa's osteoporosis program, under the direction of Dr. Kendal Hamann, has screened 90% of these fracture patients and treated almost 70% of them with approved medications. Using similar systems, other researchers have decreased hip fractures by 30–40%. For primary care and orthopedic physicians, the challenge remains to identify patients at risk, rule out secondary causes and treat those at high risk of fracture.

Once you have started using a bisphosphonate or other medication, the duration of treatment usually depends on the risk of fracture. These medications have long half-lives, are laid down in the bone and resorbed with remodeling. There is detectable drug for years after stopping alendronate, for example. Because of concerns about rare potential risks such as osteonecrosis of the jaw and atypical (e.g., mid-femur) fractures, these drugs should be used in patients at high risk of fracture. A 10-year fracture risk on the FRAX calculator of over 20–30% for major osteoporotic fractures (e.g. vertebral, wrist, humerus, hip) or a hip fracture risk over 3–4% should prompt treatment. Since hip fracture risks double every decade after age 65, this risk assessment can be repeated without bone density measurement.

High-risk patients may need lifelong therapy, but patients at moderate risk should be treated for 3–5 years—the duration proven to benefit most patients at risk for fracture. If I take patients off medication for a "drug holiday," I usually recommend monitoring bone turnover markers (e.g. osteocalcin or BSAP for osteoblastic activity and N-telopeptide for osteoclastic activity) every 6 months. Once these markers bump up by 30–50%, suggesting increased bone turnover, restart bisphosphonates for 3–5 years.

By allowing normal bone turnover, you have given the patient's bone remodeling a chance to re-establish physiologic equilibrium. Maintaining calcium, vitamin D and exercise as the underpinnings of a healthy skeleton is a lifelong process. The challenge for us remains identifying patients at risk and intervening effectively. ◇

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Promoting Physical Activity in Children

Ari Hauptman, MD

The American Academy of Pediatrics recommends that pediatric providers calculate and plot a child's body mass index (BMI) at least annually to assess the child's obesity risk. We are also asked to promote nutrition and physical activity guidelines, and to help families achieve and maintain lifestyle changes.

When it comes to preventing childhood obesity and promoting physical activity, however, it is clear that pediatricians and other child health experts must involve themselves in community advocacy—in early intervention programs, schools, child care organizations, and many other public and private community agencies. As the authors of a recent study noted, "Today's epidemic of childhood obesity makes physician community collaboration imperative."[1] Programs like Shaping America's Youth were founded on the premise that families and their communities are the most critical (and often missing) components of efforts to prevent and reduce excess weight in childhood.

Increasing exercise and physical activity in our youth is particularly daunting because many of them are inactive and unfit. Their inactivity threatens their health, bringing increased risk for hypertension, diabetes, heart disease, stroke, colon cancer, osteoporosis, poor self-esteem and depression. On the flip side, there is a direct link between physical activity and improved academic performance, reduced stress, less likelihood to smoke or use drugs, and more likelihood to stay in school. Sports and physical activity also introduce youth to teamwork, self-discipline, sportsmanship and leadership, even as they decrease exposure to gangs, drugs and violence.

Dr. Hauptman, a pediatrician at Kaiser Santa Rosa, is a physician advocacy volunteer with the HEAL Initiative.

The percentage of children and teens who are overweight has tripled since 1980 and now stands at nearly 20%. At the same time, physical activity has markedly decreased. Less than 28% of students in grades 9 through 12 participated in daily school physical education in 2003, down from 42% as recently as 1991.[2] Because children spend so much time in school, the amount of physical activity encouraged and modeled in schools is of particular importance.

Fitness is a state of well-being that allows people to perform daily tasks with vigor, participate in a variety of physical activities, and reduce their risks for health problems. The International Consensus Conference on Physical Activity for Adolescents states that all adolescents should be physically active daily and should engage in three or more sessions per week of activities that require moderate to vigorous levels of exertion for at least 20 minutes. Likewise, the National Association for Sport and Physical Education recommends at least 30 to 60 minutes of physical activity for elementary school children on all or most days of the week, including 10 to 15 minutes of moderate to vigorous activity.

Despite these and other guidelines, our society discourages physical activity in children. Their behavior is shaped by an environment that makes it easy to be sedentary and inconvenient to be active. Factors limiting physical activity in children include:

- Community design that encourages use of the car and makes walking and bicycling difficult.
- Increased concerns about safety that have limited the time and areas where children can play outside.
- Technology that conditions children to find video games and other sedentary activities more appealing than physical ones.
- The failure of communities to invest in close-to-home parks and recreation centers.

What can physicians do to increase physical activity in children? In the office setting, we must continue to calculate, plot and discuss BMI at least annually. We can use programs that involve both the child and family, such as the "Get Healthy Action Plan" described in the last issue of *Sonoma*

Medicine.[3] Many other strategies are detailed on the AAP's excellent childhood obesity website (see box for this and other websites).

Beyond the office setting, we can collaborate with the community in many ways. For example, we need to reverse the trend of the last several decades and provide quality, daily physical education for all children from preschool through grade 12 with certified physical education experts. We also need to advocate for after-school and summer programs that provide regular physical activity. An exciting new local website sponsored by Network for a Healthy California features a huge physical activity directory in which users can enter the activity they are looking for along with their zip code.

For youth sports and recreation programs, we need to facilitate participation by all, irrespective of income or transportation barriers. Likewise, we need to promote community environments that encourage walking and bike riding and that have close-to-home sports and recreational facilities. Community design has been one of the many issues targeted by the Healthy Eating Active Living initiative here in Santa Rosa.

Finally, we need to participate in media campaigns that promote physical activity, such as the iWALK movement and the Health Action campaign. I encourage you to visit the Health Action website in particular if you are interested in stepping out of the office and into the community.

There is hope for reversing the childhood obesity epidemic and increasing our youth's fitness and physical activity. Some programs highlighted above are examples of the support and efforts that have already begun in Sonoma County. The undertaking will have to involve all of us as we identify and strategize these issues. It truly is a call to action. ◇

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Physical Activity Websites

American Academy of Pediatrics
www.aap.org/obesity

Healthy Eating Active Living (HEAL)
www.sonoma-county.org/health/meetings/heal.asp

iWALK
www.iwalksonoma.org

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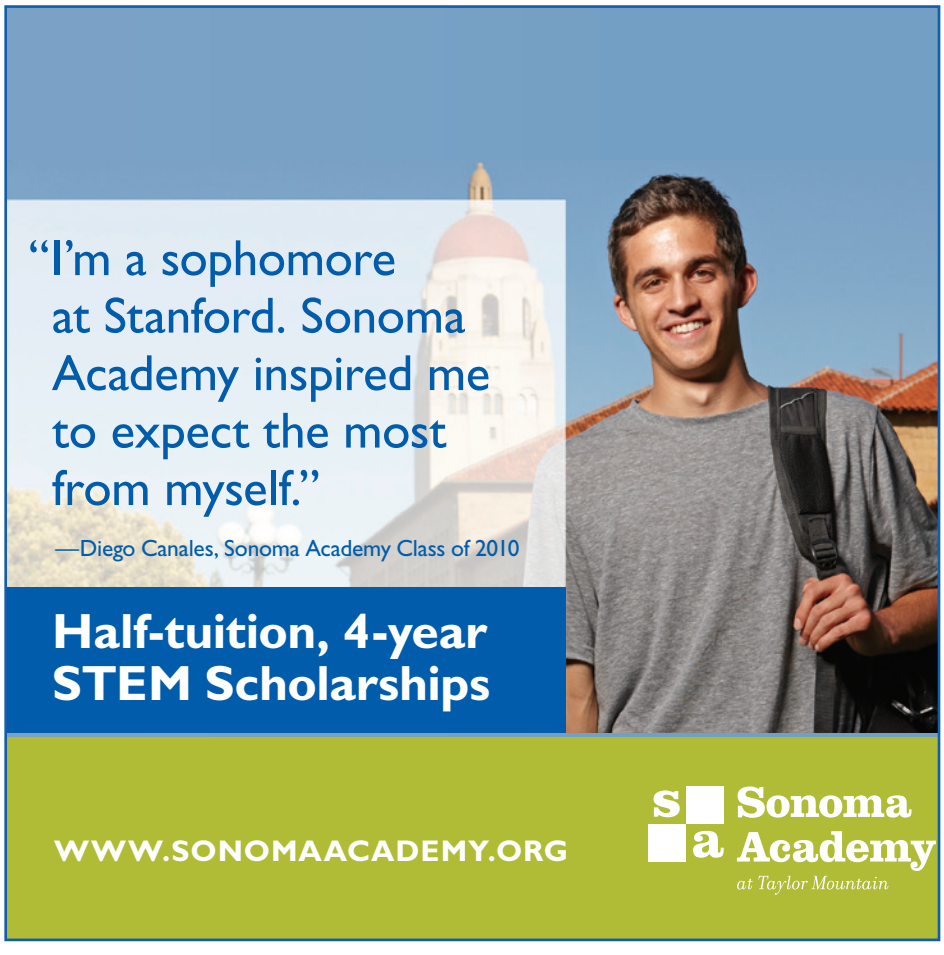
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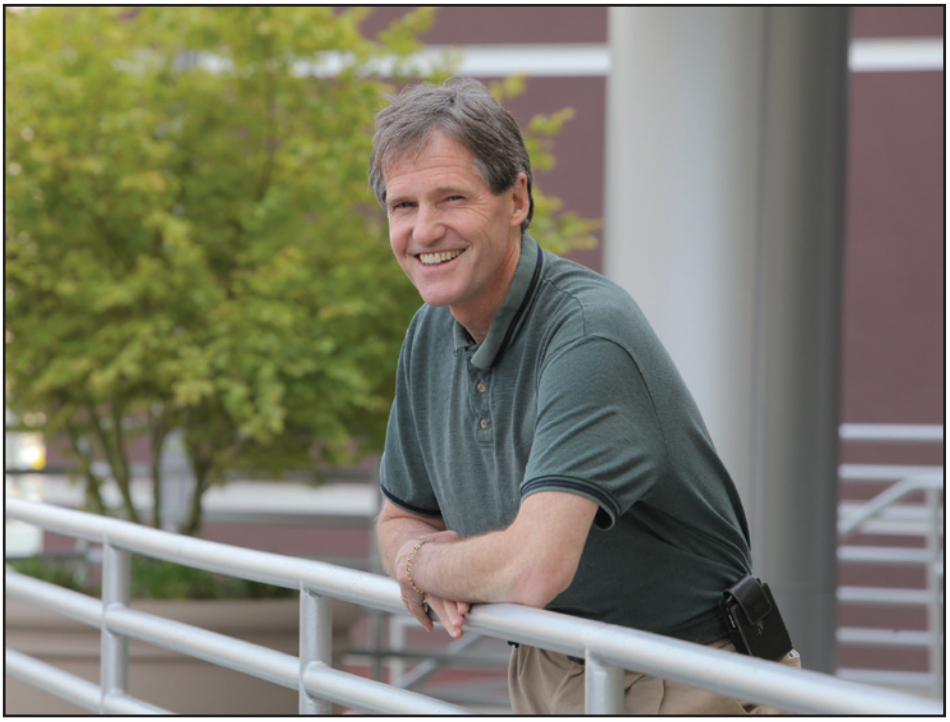

Dr. Mills outside Kaiser Santa Rosa. Photo by Duncan Garrett.

Born to a doctor and nurse in Texas in 1953, Dr. Walt Mills moved to the South Bay when he was 8 years old. He attended college at Notre Dame and medical school at UC San Diego, graduating in 1980. While in medical school, he spent an extra year studying medicine in India, ultimately publishing a paper in the American Journal of Psychology *on the effects of meditation on pain.*

Dr. Mills completed his residency in family medicine at UCLA/Santa Monica Hospital in 1983. He and his wife Elizabeth, a nurse practitioner, then traveled for two years, working at a mission hospital in Nepal and living in a meditation center in Iowa. Returning to the United States, Dr. Mills practiced at South Lake Tahoe with Tahoe Family Physicians for one year and then moved to Sonoma County.

Recruited by two Sonoma family physicians, Drs. Gary Greensweig and Jim Lowy, Dr. Mills helped start Primary Care Associates of the Redwood Empire, for which Walt and Elizabeth opened a new office in Rohnert Park in July 1986. The practice grew rapidly. Dr. Mills became a certified practitioner of Ayurvedic medicine, which attracted patients interested in alternative therapies. Primary Care Associates grew eventually to 70 providers in 14 offices serving 100,000 patients. Dr. Mills served as president and CEO when the group merged with St. Joseph Medical Foundation. In 2002, he obtained an MBA in Medical Management from USC.

In 2003, the Mills family, which by then included daughter Victoria and son Christopher, moved to Elizabeth's home town in Massachusetts, where Dr. Mills served as a medical director for Fallon Medical Group. The family decided to return to California in 2005, and Dr. Mills joined Kaiser Santa Rosa, where he is currently an assistant chief of family medicine services. For the past few years he has also been deputy director for the Santa Rosa Family Medicine Residency. In May, Kaiser announced he will become program director of the new Kaiser Family Medicine Residency, which will open in 2014.

This interview was conducted at Kaiser Santa Rosa on May 2.

At what point did you decide to become a physician?

My mother was a nurse, and my dad was a physician, which I know influenced me. In elementary school I remember wanting to be a doctor. When I was 14, my 37-year-old mother died of

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Mr. Osborn edits Sonoma Medicine.

breast cancer. My father was a hematologist/oncologist. I remember making a promise to my mother, somehow or another I was going to become a doctor.

Why did you decide to specialize in family medicine?
In college I learned transcendental meditation, and I wanted to integrate what I was learning about spirituality into my career in medicine. Family medicine was conceived around a biopsychosocial model and thus was a good fit. I actually was torn between internal medicine and family medicine when I was deciding on my residency, but eventually chose family medicine as it seemed to be a holistic specialty attending to the mind, body and spirit.

In medical school I had good role models—doctors who seemed to be really excited about taking care of patients and families, the whole continuum. Being there when people are born, at the end of life, and everything in between was attractive. I have always been a people person, and being a family doc taking care of patients as friends seemed like a wonderful way to aim my career.

The last piece that sealed it for me was the people I met in family medicine. They were kind, compassionate and, for the most part, idealistic and mission-driven—wanting to make a difference in the world. During my 30 years learning to be a family doc, I've increasingly appreciated that family medicine is my calling.

In 2009, you received the Outstanding Contribution to the Community Award from SCMA for your work with the Santa Rosa Family Medicine Residency, the Southwest Community Health Center, and the Northern California Center for Well-Being. Let's start at the end. Could you describe how the Center for Well-Being began?
In the early 1990s, I was given a small grant by the Sisters of St. Joseph's of Orange to look at community health. We pulled together the meditation programs that I had been developing, along with the cardiac rehab programs at NCMA and Cardiology Associates. We brought nutritionists, yoga instructors, and a variety of other instructors together to start providing health education that included attention to the mind, body and spirit.

In 1994, Dr. Jim Price, at that time the president of NCMA, Memorial Hospital leadership, and Primary Care Associates formed a new 501(c)3 nonprofit called the Northern California Center for Well-Being. We ended up contracting with all the local health plans, including Kaiser, to provide educational programs that otherwise were not getting done. I had the pleasure of serving as president until 2003, when I moved out of state. The Center has an amazing dedicated board and staff that continues, despite a small budget, to sponsor many wonderful health education programs. In fact, our residency refers many of our safety net patients there currently.

You were also recognized for your work with the Southwest Community Health Center, which was one of the first health centers in the county. Where do you think the health centers are going? Do you think they will continue to expand?
With health reform, the good news is that access to primary care services will continue to improve as we are incented to build effective "patient-centered medical homes" for all our citizens, especially the underserved, who traditionally have had their primary care done in emergency rooms. I think the health centers will cover a good portion of the people who are going to be insured with health reform. Most important, they will continue to serve a role for the uninsured. We are still going to end up with a significant number of people who, for various reasons, are not going to qualify for coverage. The only place they will have reliable access to primary care is through the community health centers.

You were honored as well for your contributions to the Sutter family medicine residency. Now Kaiser plans to establish its own family medicine residency. Could you explain how you reached that decision? What were the factors?
In 2006, Sutter was considering closing its hospital in Santa Rosa, which would have meant that the residency that has been in our community for over 60 years would have had to find a new sponsoring hospital, or close. Sutter reached out to Kaiser, Southwest Community Health Centers, and other stakeholders, including SCMA. As a result, I got involved with the residency and was asked to be the Kaiser liaison. Over time I became the deputy program director. One of the many delights of my job is that I work with Dr. Jeff Haney, who is our extremely talented program director.

Under Dr. Haney's leadership, the residency has had a successful turnaround and continues to be one of the most successful in the country. Last year, we had over 600 applicants for our 12 intern spots. Wonderful residents continue to train here, and many stay in our community. Last year, 10 of the 12 graduates went to local community health centers.

Given our success and the predicted shortage of primary care physicians, Kaiser, Sutter, Santa Rosa Community Health Centers and our other community partners have spent the past few years in dialog about how to ensure an adequate workforce to meet the needs of our community. Last year SCMA partnered with the Department of Public Health and came out with an elegant workforce analysis which predicted that Sonoma County will soon be critically short of primary care doctors. After much due diligence, we agreed the best model for expanding our residency training in Sonoma County was to have a new Kaiser-sponsored residency program. As an educational collaborative, we will share current didactics, curriculum, faculty, clinical rotations, and other resources. Between both programs, we will go from 12 residents per year to 18 residents per year, each spending three years in training. Thus by 2016 we will have 54 physicians

in training in Sonoma County, once the new program is fully up and running.

Will the residents who come through Kaiser do the same rotations as the Sutter residents? Will they be going to the community health centers, or are they going to be restricted to Kaiser?
We are currently designing the new program so it's not clear, but we are going to collaborate across curriculum and rotations. Likely the Kaiser residents of the future will spend some time at community health centers, and perhaps at Sutter Hospital, just as the current Sutter residents spend time at Kaiser. Our residents will spend most of their time at Kaiser because they have to have continuity with patients for training purposes. That said, it will be enriching for those residents to spend time in a wide variety of community experiences, like the mobile health van, homeless shelter, school-based clinics, and the Jewish Community Free Clinic. We want the graduates to feel comfortable practicing not only at Kaiser, but also anywhere else they might want to go around the world.

The Mills family: Christopher, Elizabeth, Walt, Victoria. *Photo by Will Bucquoy.*

Will you continue as the deputy director of the Sutter residency?
I am going to be the program director for the Kaiser residency. Dr. Jamie Weinstein, a Kaiser faculty member, is going to become the deputy program director of the Sutter program and will work with Dr. Haney to ensure that we continue to support the current residency. *[Editor's note: For more details on the Santa Rosa Family Medicine Residency, visit www.srfmr.org.]*

The Affordable Care Act envisions several new types of medical models, the most prominent of which is the Accountable Care Organization. What is your view of ACOs?
Regardless of what happens with the individual mandate, we are now on a path that will eventuate in the rest of the Affordable Care Act, meaning there will be patient-centered medical homes providing primary care within larger medical neighborhoods called Accountable Care Organizations. I think there is a moral and financial imperative for us to do that because we know that the quality of care is better and the cost is less in such integrated delivery systems. We know that lives are saved and there is less preventable disease when we are taking care of prevention and chronic care, and leveraging advanced technology and information systems as is intended for ACOs. For now the ACO is a good way to be thinking about how we can best meet the challenge of providing high quality, affordable health care for our community.

Are there other reforms that you think are needed beyond the Affordable Care Act? Is a public option still on the table? What about single payer?
Those are just payment methodologies and, while necessary, remain insufficient. Real health reform is about redesigning the entire delivery system, including payment models that align incentives to provide the exceptional care we are capable of in the 21st century. I am much more certain that we are going to reorganize the way we provide care. I think the payment mechanism is going to continue to change depending on economic and political forces, but eventually the competitive market forces will arrive at new payment models that will do more than bend the cost curve. We spend 16% of our gross domestic product on health care, with predictions of 20% in a few years, which is totally unsustainable. If we continue to do things as we are now, we may be out of business by the end of this decade.

Do you have any particular interest in clinical medicine?
Family medicine is great for me because I find I'm interested in a broad range of clinical medicine. During my career I've enjoyed delivering lots of babies, assisting at surgery, doing in-office procedures—basically the full scope of family medicine. I have an added qualification in geriatrics and am certified by the American Board of Holistic and Integrative Medicine.

Now that I'm teaching medical students and residents on a daily basis, I have a new excitement about clinical medicine, with continual discoveries of how to better provide a therapeutic alliance with patients in need. Clearly, for me it's the people part of clinical medicine that interests me the most. I probably get a hug from most of my

patients, and at the end of the day that is what it's all about.

I would like to understand the importance that love and compassion have in being a good doctor. That is probably my keenest interest at this stage of my career—how does one be a true healing presence? Our residents and fellows have taught me a lot the past few years, the biggest learnings being around such areas of energy medicine like acupuncture, Reiki or Tai Chi. Somehow spirituality and healing are woven into my appreciation of clinical medicine as well.

Americans have many lifestyle-related chronic conditions that you probably have to deal with every day. Where does your responsibility begin and end? How involved do you think doctors should be with their patients' lives?

I have seen studies showing the majority of illness is lifestyle related. I believe the doctor-patient relationship is a sacred and critical part of the solution to "lifestyle medicine." The behavioral change tools and skills we have are far better then when I was trained. Motivational interviewing, shared decision making, mind-body medicine, integrated behavioral health, group visits, and other innovative care models are blossoming in our training programs and are supported by solid science.

I think as physicians, scientists, leaders and community members, our responsibility is to ensure that our systems are aligned with good health practices. For instance, we should never serve food in a school that isn't healthy food. We should structure things so that smoking is more difficult. We should build environments so that exercise is a norm. For example, support healthy ways to get to school with paths for people to ride their bikes or walk safely.

You ask how involved should physicians be in their patients' lives. I guess I believe we should seek that sweet spot of involved enough to make a difference. The evidence that a doctor's caring attitude is a potent influence of a patient's ability to change behavior is strong. It also improves actual effectiveness of a medication. When a doctor performs the "ritual" of writing (or typing in the computer) a medication order, the patient experiences a better result when the patient believes the doctor cares and is their advocate.

Is community health training something you would see implementing in the local residency program?

Yes. Our academic sponsor at UCSF is actually the Department of Family and Community Medicine. Family medicine has always included community health training as a requirement. With our partnering with Santa Rosa Community Health Centers, we've been able to improve on our curricular offerings for our residents. Most of our residents do community health projects. Most spend time in developing countries, where there is significant experience in community medicine. Many have master's degrees in public health. I actually hope we start to sponsor advanced fellowships in community medicine in the next few years to better train our future physicians. Countries like Spain who have done such programs have seen dramatic improvements in their communities' health. We hope to do the same.

Speaking of community, you are a longstanding member of the medical association, which is a community of physicians. How do you think membership has benefited you?

I think part of the fun of being a doctor is having the privilege of being with the incredible community of other physicians. SCMA is an important resource for our community of physicians. Most of us are working for different organizations, but SCMA lets us reconnect with each other and often reminds us of why we went into medicine. That has really been a theme for me for the last 26 years of being in SCMA. It's a place where it doesn't matter where you work. We're bonded as colleagues. We can talk to each other, share our hopes, dreams, frustrations. I think that is just so important to feel connected to other humans, and as a physician where the stress is often such a challenge to our well-being, SCMA provides a home for us to provide one another with support. At times, when things come together, we can find joy in what we do together.

Nonetheless, SCMA and other organizations face challenges in recruiting physicians.

We have one of the highest membership rates within California medical associations, which speaks to the special way our physicians feel about SCMA. That said, we are in a very crucial time for our profession. Are we going to be led and managed by MBAs and attorneys, or are we going to be in organizations that are consistent with the physician ideals of putting the patient first? I always say, SCMA is our only significant organized physician voice for advocacy in the legislature, and for being able to address common concerns like specialty and primary care access, payment reform, public health, workforce development, and so many other worthy causes. We became physicians to make the world a little better place; we can't do it in isolation, but need to organize ourselves. SCMA supports physicians coming together, effectively using our volunteered energies to work with our talented SCMA staff to get important things done, that otherwise would not.

Do you see any particular challenges for yourself in the next few years? What are your major goals?

Health. If I have a message this year for my fellow physicians in our community, I would want them all to be taking care of themselves, seeing their doctor, following the kind of prescriptions that we give to our patients for healthy living. Staying connected with those that you love. Make sure you stay focused on your purpose and passion.

I am blessed with my dream job right now. I get to take care of patients, teach, and help build new programs that have value. Without health, I suddenly can do none of this. My specific professional goals in this final stage of my career are simple: to help build a successful

new residency program at Kaiser while supporting the continued excellence of our current Sutter residency; to further the evidence-based use of integrative, whole-person medicine; and to keep the joy alive in a medical life.

Is there any particular experience you have had in your career that summarizes what you think about medicine or about being a doctor?
I know a young man who has disabling Tourette's syndrome. As his family doctor, I have been there for him: given him medications, taught him relaxation techniques, ensured that he was seeing all the right specialists, and doing the best evidence-based whole-person care I know. Six months ago, neurosurgeons at another Kaiser hospital implanted some deep-probe electrodes in him and turned them on, just like a pacemaker. His Tourette's syndrome, which was basically constant—he could not even sleep without heavy dose narcotics and muscle relaxers—"went away."

Recently he walked into my office smiling, gave me a hug, said thank you—and he had his life back. To me this represents the amazing medical possibilities of 21st century medicine. I just love "miracles."

Do you have any closing thoughts?
In the year 2020, I want us to be able to measure and say that every single citizen in Sonoma County has access to a patient-centered medical home. I hope we have the will to get to universal access, to address the immoral social injustice that health care disparities represent. For the past four years I've been on Sonoma Health Action, a program founded by the County Board of Supervisors (go to www.sonomahealthaction.org). Our goal is that by 2020 every citizen really does have access to a medical home and we are the healthiest county in California. I hope this becomes a compass for all of our physician community and that along the way we find joy in our shared medical lives. ◇

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Natural Agents for Musculoskeletal Conditions

Sidney Kurn, MD

The prevalence of musculoskeletal injuries and chronic musculoskeletal conditions is quite high compared with other medical disorders. In a classic study of adults, about 33% were found to have signs of a musculoskeletal condition on exam.[1] The highest prevalence was 15% for the back, followed by 12% for the knee. A more recent study found a similar 25% overall background prevalence of musculoskeletal symptoms in adults.[2] Injuries occurring in the context of sports had the highest prevalence.

The goal of this article is to present evidence for using natural agents to treat musculoskeletal conditions. This requires some examination of the pathophysiology of inflammation and how the biochemical mechanisms of various nutrients and herbs can mitigate the inflammatory process and promote healing. Lest the reader think that use of natural agents is ancillary or incidental, we need to remind ourselves of the 1% to 2% of clinically significant upper GI events with NSAIDs. Of the 60 million Americans using NSAIDS on a regular basis, reports of NSAID-associated deaths range from 3,200 to 16,500 per year.[3]

Other concerns with NSAIDs include their negative effects on cartilage formation and renal function.[4] In addition, numerous references suggest that the benefit of NSAIDs in acute sports injuries may result in pain reduction without mitigating the inflammation or aiding the healing process.[5]

Dr. Kurn, a neurologist and acupuncturist, is the co-owner of Farmacopia, an herbal pharmacy in Santa Rosa.

Pineapple, the source of bromelain.

The anatomy of tendons is complex. The tenocytes are a very small component of tendons, which consist mainly of extracellular matrix, predominantly Type I collagen, 30% water and small amounts of elastin, proteoglycans and inorganic elements, including copper, manganese and calcium. The tenocytes manufacture collagen molecules, which align end-to-end and side-to-side to form fibrils, which combine to form the fibers of tendons.

Tendon pathology includes inflammation of the peritendinous sheath lying between the tendon and the tendon sheath; non-inflammatory injury or tendinosis; and tendinitis with inflammation of the tendon and disruption of the vascular supply. After injury, the tendon becomes inflamed, followed by repair and remodeling. The tenocytes control the healing process and manufacture new collagen to undergo remodeling. Unfortunately, healed tendons do not regain their full pre-morbid mechanical properties.

Muscle, tendon and ligament inflammation after injury is a complex process involving overlapping cell types and a cascade of molecules, including cytokines, permeability factors, prostaglandins, tumor necrosis factor and growth factors, among many others. Musculoskeletal inflammation is a visible expression of the highly complex innate immune mechanism of multiple cell types and hundreds of molecules choreographed to protect the body from injury and direct the healing response.

In the acute phase of inflammation, platelets bind to collagen, ultimately forming a platelet "plug." They also secrete reparative mediators, such as TGF beta, which ultimately causes fibroblast proliferation and matrix secretion. Another important inflammatory mediator is IL1, which induces matrix metalloproteinase (MMP) secretion from fibroblasts. MMP degrades the damaged matrix and allows for inflammatory cell proliferation. Neutrophils destroy damaged tissue then undergo apoptosis, later undergoing phagocytosis by macrophages.

After 24 hours, macrophages and monocytes predominate. Macrophages secrete over 100 information molecules,

predominantly pro-inflammatory mediators. By 14 days, the "granulation" phase becomes active, and lymphocytes predominate, supporting angiogenesis and collagen secretion. (A weakened lymphocyte response delays and inhibits adequate wound healing.)

The later stage of healing also involves proliferation and activation of fibroblasts that migrate into fibrin clot located in areas of blood extravasation in sites of inflammation. The fibroblasts secrete a hyaluronan-rich matrix and evolve into contractile myofibroblasts. New collagen fibers are organized into tendons and ligaments. The collagen fibers wind around each other and contract, expressing fluid and ultimately shortening to create a mechanically sound tendon or ligament.

During this process, vascular endothelium, mast cells and peripheral nerve cells also play a role in both the inflammatory and healing process. Improper healing can occur with an excessive inflammatory response and exuberant edema, making tendons or ligaments elongated or disorganized.

A fundamental difference in the use of herbs vs. pharmaceuticals is the multiplicity of effects of herbs due to their myriad constituents. Herbal constituents—such as terpenoids, alkaloids, polyphenols and glycosides—act on numerous receptors in the body with an "ensemble" effect. Most herbs contain many classes of constituents, thereby interrupting pathogenic mechanisms in multiple ways. This herbal complexity is similar to the complexity of inflammation in musculoskeletal conditions.

The following supplements have experimental and clinical evidence for benefit in musculoskeletal conditions. For a definitive review, I refer the reader to a recent article from the University of Pittsburgh on the use of natural anti-inflammatory agents in athletic injuries.[6]

Curcumin

Curcumin is a good example of the "ensemble effect" of an herb. The yellow pigment in the spice turmeric, curcumin has a long history of use in Ayurvedic medicine, including topically, orally and by inhalation. PubMed contains many articles in peer-reviewed journals on the clinical application of curcumin for inflammatory disorders. It has been used for disorders of skin and lungs, gastrointestinal disorders, wounds and sprains. Laboratory studies suggest antioxidant, anti-inflammatory, antiviral, antibacterial, antifungal and anticancer effects.[7]

Curcumin down-regulates inflammatory transcription factors, enzymes and cytokines. As intimated above, all these molecules play an interdependent role in inflammation. This complex action contrasts with the singular mechanism of COX inhibition by NSAIDs and the blockade of tumor necrosis factors by TNF inhibitors. Curcumin generates its potency through its multiplicity of effects.

A double-blind study using a combination of curcumin and boswellia (an anti-inflammatory gum resin) showed significant improvement in 49 patients with osteoarthritis of the knee.[8] Curcumin has also been the subject of positive clinical studies in rheumatoid arthritis, chronic anterior uveitis and inflammatory orbital pseudotumor. The side effects of curcumin are minimal, but it can cause stomach upset.

Bromelain

Bromelain is a proteolytic enzyme extracted from the stem of the pineapple plant. Systemic enzyme therapy has a long history of use, particularly in Europe. Proteases like bromelain clear injured tissues of inflammatory cytokines, damaged peptides and proteins, and advanced glycation end products. In particular, bromelain appears to lower pro-inflammatory prostaglandins and promote the prostaglandin E1 pathway. Bromelain may retard the movement of neutrophils to sites of acute inflammation, degrade fibrin and fibrinogen, and lower kinin levels, thereby decreasing vascular permeability through a second pathway to the prostaglandin pathway. It may also lower pro-inflammatory cytokines.

Like curcumin, this ensemble of effects is a good match for the complex mechanisms of inflammation. Bromelain appears to be clinically effective in studies on wound healing and osteoarthritis.[9,10] The mechanistic overlap between these conditions and acute sprains and strains suggests its use in this setting as well. Bromelain can aggravate digestive ulcers and esophagitis and is a mild anticoagulant.

Lyprinol

This stabilized lipid extract of the New Zealand green-lipped mussel shows significant anti-inflammatory effects. Clinical studies of lyprinol have demonstrated it efficacy in treating osteoarthritis, rheumatoid arthritis and asthma.[11-13] An interesting study out of Australia showed that lyprinol was comparable in efficacy to ibuprofen and naproxen in an animal model without GI side effects.[14] Overall, the properties of lyprinol recommend its use in acute and chronic musculoskeletal conditions, without significant side effects.

Space permits only mention of other potentially beneficial natural compounds for acute and chronic musculoskeletal conditions. These include white willow bark (the source of acetylsalicylic acid), pycnogenol (derived from the bark of the maritime pine tree), boswellia (a resin from the Boswellia tree) and cat's claw (a Peruvian herb).

Several nutrients are recommended for athletes to prophylactically reduce the effect of injuries. Most beneficial are omega 3 fatty acids and green tea polyphenols. Both have multiple anti-inflammatory properties and are protective against the oxidative-inflammatory effects of aging. A high quality fish oil (the most common source of omega 3 fatty acids) should state that it has been assayed and is free of heavy metals and halogenated hydrocarbons. ◇

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References appear on page 38.

The Snake and I

Michael Sergeant, MD

I was just after a few rocks. That's all. I wanted to make a beautiful arrangement for my wife, Diane, who was returning in the morning from taking care of her mom in a hospital in Atlanta.

I had the roses: delicately beautiful, magenta, magic. I had the lovely vase from Portugal. What I needed was a few desert rocks to complete the picture in my head and the feeling in my heart. It didn't quite work out that way.

The magic was different: I got to dance with the power of nature.

I was singly focused as I walked out the front door with a dishpan to gather those few desert rocks from our front garden in Tucson, Arizona. My vision was tunneled toward the creative endeavor.

I think the snake (or maybe snakes) would actually have been quite satisfied to be left alone. I expect it was not the least bit pleased to have the still of the evening disturbed by a human tromping around and picking up the rocks near which it lay. It is also possible that there was an even more egregious infraction: snake coitus interruptus. Whatever the case, indicting said snake or snakes for the subsequent events would be inappropriate.

So there I was, contentedly in my own front yard, dressed in my desert best (shorts, T-shirt, flip flops), in the pale glow of the front porch light, gathering a few rocks I thought would lend beauty to my arrangement. Beneath the nearby garden wall, the ground was in shadow. I was oblivious. The night was quiet.

I was bending over to pick up the last couple rocks when my peaceful world exploded in pain. My left foot had been crushed, it seemed, by an acid-coated sledgehammer wielded by none less than John Henry himself. Shock first. Then a knowing. And then, only after the truth had already permeated my consciousness, the slight and ever so ominous rattle. What I would not know until the next day is that I had actually, in that life-changing split second, been bitten twice.

The brief moments following the shock resulted in only a little disruption of the quiet desert night as a few choice words erupted from me; not so much as a yell, more as a series of almost disbelieving profane whispers. My mind, once convinced of the reality of being snakebitten, switched almost immediately to a kind of analytic stillness. As I hobbled into the house, I told myself that 20–30% of rattler bites are not poisonous, and though the ongoing

Dr. Sergeant, a graduate of the Santa Rosa Family Medicine Residency, directs hospital medicine at the Gila Regional Medical Center in Silver City, New Mexico.

pain was telling me otherwise, I was briefly hopeful that would be the case for me. By the time I reached the bathroom, my hopes were dashed when I saw that my foot had ballooned to half again its normal size.

In the bathroom I found the top of my foot bloody. I had a syringe right there and actually attempted to aspirate some of the venom from the wounds. This was not one of my more brilliant moments, but the illusion that this would be effective fortunately lasted only a few seconds, ending with my recognition of the foolishness of the endeavor and an understanding of my need for immediate medical care. I needed antivenom, and I needed it as quickly as possible.

Back to clear thinking. I considered calling 911 for an ambulance and medics but reasoned that by the time they got to me, got me loaded and then again left, much more time would be eaten up than if I just took off for a hospital. So, with increasing discomfort (euphemism for pain), I got out to the garage, grabbed a tourniquet from the crash bag I keep in the car, and opened the garage door. There was a brief moment of internal debate as I considered the tourniquet: current evidence recommends *against* the use of them in snakebite as the amount of local damage is increased and there is a risk of bad things happening when the tourniquet is removed and a bunch of toxin is quickly released into the general circulation. Despite this knowledge, I decided to apply the tourniquet lightly, hoping to diminish systemic effects of the venom while driving to the hospital.

Once in the car, I realized I was unsure which hospital to head for as I was right between at least two. So I finally called 911 while driving to ask if there was a regional snakebite center. There wasn't. I found that the 911 dispatcher was not pleased that I didn't want to wait for an ambulance. When I said jokingly that I knew I was fine because I knew it was October 1947, her angst amplified significantly, and I had to convince her repeatedly that I was joking and that I was OK to drive. That said, it was a very surreal journey as I drove to a large private hospital, pointedly avoiding the regional trauma center on an urban Saturday night.

When I arrived outside the ER, the venom effects were getting markedly stronger. I was unable to bear any weight on my left foot and was feeling progressively more ill. I left the car in front of the ER and hopped in. Once I announced the nature of my problem, I was quickly wheeled back to the triage area, where two IVs were started and blood was drawn.

From that point on, events settled into a strange kind of slow motion. I was moved into a treatment area, where I was first seen by an ER nurse, then by an intern and a resident who really knew nothing about snakebite. I treated my own anxieties by talking to them about the pathophysiology involved. The attending physician finally showed up and ordered the antivenom. Herein lay the next problem: antivenom takes about an hour just to reconstitute. Tack onto that the time required to transcribe the order, send it to pharmacy and for pharmacy to get to work on it . . . there was an eternity yet to wait. By that time I had removed the tourniquet and had slipped briefly into a bit of denial imagining that I might somehow get a few vials of antivenom and then dance on home as if nothing had happened.

A brief digression regarding that dangerous Egyptian river, Denial: its currents are powerful indeed, with all kinds of eddies and undertow. I myself have treated quite a few rattlesnake bites and have seen how dangerous they can be. While none of my snakebite patients have died, they have all required at least a couple days in the ICU. Thus my brief fantasy of dancing on home was silly indeed, not to mention that the antivenom itself, though far safer than what we used to use, still has a bit of inherent risk.

Suddenly I felt poorly and said, "I feel really bad here y'all." I was immediately surrounded, my gurney was tipped head down, and someone said my pulse was in the thirties and my blood pressure was in the fifties. These aren't good numbers. I don't remember how they knew my blood pressure so fast, but I do remember feeling a way I've never felt before. It was something like the feeling one gets just before vomiting or perhaps before fainting. It was like being both here and there and not knowing which was what.

Someone said, "Get the pacer pads," and a nurse put them on me. Then another moment of brilliance. I, the trained physician, said, "Don't do that, it will hurt." I laugh now as they did then. After all, what are some little shocks compared to the pain that was now climbing my swollen leg? Further, if I did need to be paced, that pacing would keep me alive.

Good fortune followed. I never did require pacing, though I got close once or twice more. Lots of IV fluid running into both arms seemed adequate as a start. Maybe an hour and a half or two after my arrival in the ER, the antivenom was finally ready.

In these trying economic times, antivenom is its own adventure. It costs about $2,000 a vial, and I required 12 vials. Surprisingly, this is a moderate dosage. I have seen as many as 22 vials given in extreme cases, particularly when there is a long time between snakebite and medical care.

Once the liquid money had started flowing into my veins, I was transferred from the ER to the ICU. I arrived in one piece, still breathing and with my heart doing its work unaided. My nurse was a rugby-playing Canadian named Ron. He was great. He assisted me in the final transition from human to patient by helping me into the stylish, if somewhat revealing, hospital gown. The movement required was surprisingly painful.

As I settled in and tried my best to answer yet again all the usual questions, I realized how far into a haze I had descended. The challenge of the evening was to control pain while maintaining blood pressure, which unfortunately are goals that can be at odds with one another. Despite liters of

IV fluid, my systolic pressure was only in the 80s or 90s, and the nurse could not give me any narcotic for fear of further lowering it. Moreover, I couldn't take any kind of aspirin or related pain meds because they interfere with platelet function. The swelling, meanwhile, progressed relentlessly. By the wee hours of the morning, I could leave a dent knuckle-deep in my hip from the bites on my foot. It was a long night.

As morning approached, though I was still sick and miserable, neither my survival nor my ultimate recovery seemed quite as uncertain as they had the night before. I wanted my wife. I thought I should call her before her flight, but after she had slept. It was a simple little call. "Hey honey. Not to worry, everything's fine . . . I just happen to be in the ICU with multiple IVs, pacemaker pads and antivenom dripping in. The weather's great." Well, that's not exactly what I said, but I was trying to communicate that really, I was OK. I don't think that part went so well. When she finally did arrive hours later, she was an angel manifest. From that moment on, the gifts emerged and began, ever so slowly, overcoming the costs.

Maybe, just maybe, that was the point of all this: the gifts.

We are vulnerable beings on the physical plane. A creature that probably weighed less than five pounds changed my outlook and came treacherously close to extinguishing it in a mere moment. As the first drama receded, during times that the balance of pain control and narcosis allowed, I began to get glimpses of understanding about my own vulnerability.

The next couple days were spent in the hospital with very good nursing care. My blood pressure came up, making pain medicine finally available. This time is a bit of a blur. I became quite anemic from the effects of the venom. On the last day, I tried to move around a bit, but the pain was searing any time my foot wasn't elevated. I was pretty weak. Just maneuvering to the bedside commode was both immodest and excruciating. Still, healing had commenced.

There were moments of frustration and of laughter. On day 3, I was discharged from the hospital with a final touch of humor. My nurse on that last day looked to be about 11. She was asking me her nurse questions, and when she got to "What is your work?" I answered that I was a doctor. She was shocked. Why would I say that? I can only quote her: "Uhn uh, a physician? Shuuut uuup!" I found this hilarious but also a reminder of the mythology that doctors are somehow made of something different from "regular" folks. Lying in that bed, unable to take care of myself, I was reminded of just how regular I am.

I've now been home for a few weeks. I am just beginning to bear a bit of weight, and the swelling is now limited to the foot and ankle. My platelets fell last week, and I had a little bleeding under the skin, but that has now resolved. I know I will be rehabilitating for some weeks to come. I am on the mend, but somehow I am not the same.

Above I mentioned gifts. That is what I have taken from this experience more than anything else. I have been given a much deeper understanding of who I am, stripped of my titles, and even of the physical abilities by which I define myself. Under all that I am just a man.

I have worked at my job a few days and found it remarkably difficult physically, yet the support and care of those with whom I work has filled my heart. I have come to an even more powerful experience of love: that of my wife, my family and my community. A couple rattlesnake bites that landed me in the ICU and waved my mortality before me have not left me traumatized nearly so much as thankful. Not to suggest that I would be interested in a repeat performance; no, once is enough. Yet, I would not wish for this not to have happened. The many costs of this event are repaid with interest by what I was given on a Tucson Desert night. ◇

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Being the Music

Colleen Foy Sterling, MD

help im in heaven with no dance partner

I opened the text cautiously, not recognizing the author. Choosing my words carefully, I wrote back: "Who are you? *Where* are you?"

Sorry I'm in new orleans at jazz fest. Hope to dance with you soon.

Now *that* made sense. Don's messages are like that, cryptic, dry and terse. Not at all like the man himself. Don is a person who has truly come through tragedy and danced his way to the other side. Most would fear what he has had to endure.

The first time I danced with Don at Monroe Hall in Santa Rosa, I was a neophyte, fighting depression, burnout and nasty dizzy spells. I was still very much in my "I'll wait for someone to ask me to dance" mode. A guy I had never met slid across the wooden floor, stopped right in front of me and held out his upturned hand. I took it, and we started a waltz. I felt confident. As a child, I had roller-skated around the garage listening to my Grampa Phil's waltz records on the Victrola. As a young adult, I had played waltz after waltz on a baritone horn.

This time Tom Rigney and Flambeau were playing "The Yearning Heart," which is just right for a sad girl at a dance hall. I counted my one-two-threes and felt like I was doing a pretty good job. "Lean into my hand", Don muttered during the straightaway just before a corner, "If you don't lean your back into my hand, we lose the connection, and I can't lead!" I felt my confidence seep out. I wasn't going to be good at this. But I didn't have time for negative thinking.

The Nutcracker. *Photo by Dr. Foy Sterling.*

I leaned back into his hand and surrendered all that I had learned in my career: Be confident! Stand on your own two feet! Be a leader! In this second, I had to be a follower; I had to depend on someone else. As I leaned into Don's hand, I felt support against my upper back. Like a ride at the fair, we took that corner going what felt like 90 miles an hour. I couldn't help but giggle with the nervous thrill. I tried to remember to fix my gaze on a spot, as we spun around each other and Don opened me into a turn, within a turn (as a pair), around a turn (the corner of the dance floor). I tried to wrap my brain around the physics involved in all those layers of turning, but that is the beauty of dance: the music, and the movement, and the mesmerizing meditation. You have to keep your focus on the steps and the balance, and on your frame as an individual and as a pair. When dancing, it is impossible to worry about *anything*. Dancing is the meditation that comes with making music, but this time *you* are the music.

After the last pull of Tom Rigney's bow on the fiddle, the waltz was over, and we slumped down hard on the wooden benches that line the walls of Monroe, a traditional dance hall. I leaned back and Don leaned forward to adjust his boot, or so I thought. When I looked, I saw that Don had simple and well-worn dress shoes. I heard the familiar sound of a snap and re-snap, as he adjusted something near his knee. It was a sound I had heard many times years ago, on a rotation at a VA hospital.

It took a moment to locate the sound in my memory. I looked at Don, and he looked up and very matter-of-factly said, "My prosthetic." Laughing, he went on. "Yeah, motorcycle accident. I was at Petaluma Valley Hospital for a couple of months. They tried to save my foot, but it didn't work. They gave me an epidural so I wouldn't get phantom pain, and a few days later I had the surgery."

I didn't say anything; I just listened. "In physical therapy I started to walk as soon as I could, then I went down the hall and found a friend of mine I knew from the dance hall and I waltzed with her right back into the PT room. Everyone was amazed! I was a dancer before the accident, and I was determined to dance as soon as I could after my surgery."

Dancing can get you through almost anything. But why dance in the first place? I am pretty sure that some readers are already murmuring, "Not

Dr. Foy Sterling, a family physician, serves on the SCMA Editorial Board.

since square dancing in fourth grade have I danced, and I am sure as heck not going to start now!" Nonetheless, you can tell yourself you are going to dance because, according to a study of leisure activities, dancing is associated with a lower risk of dementia.[1] Or how about this fact: moderate and mild exercise (including folk and slow dancing) can lower lipid levels, improve insulin sensitivity, reduce diastolic blood pressure and improve emotional well-being.[2] And since fall prevention is a priority in our patient populations, remember that dancing and Tai Chi are recommended activities for preventing falls.[3]

Yes, dancing has been proven to improve health, but dancing is so much more than that. The only way to understand this is to try it out. If you are not dancing, how can you earnestly recommend dancing to your patients? If you are not a dancer, how do you start? I felt I could use some help, so I sent an open-ended survey to dancers in Sonoma County and received an enthusiastic "flash mob" of responses. I also interviewed dance instructors to help make a lesson plan, since *Sonoma Medicine* readers are life-long learners. Here is that plan:

Start early. In response to my email, a cheerful troupe of dancers bragged that they had started dancing later in life; but many had danced in some way all of their lives. If you have young patients or parents of kids in your practice, encourage young ones to "hop to it!" Tina Iardella is the owner of M.Studio on Santa Rosa's southwest side. She cannot stop talking about the health benefits of dance. She is proud of the school program she designed, KidzGroove, which she has taken to seven grade schools in Sonoma County.

KidzGroove incorporates jazz, ballet, salsa, break dancing and hip hop in a step-wise immersion into the world of dance, eight counts at a time, "When I start working with kids," says Tina, "they are out of breath after the first two minutes." But after moving and dancing only one hour a week, the children build up their endurance from three minutes to five minutes. By the end of the school year, the same kids are dancing non-stop for the entire hour. "Kids were coming up to me, pulling at their loose-fitting pants, showing me what good shape they were in," recalls Tina.

You may think it is too late to "get started at young age," but pick a class and just show up! As the cognitive therapy saying goes: "In depression, action does not come from motivation, action leads to motivation." So take action. Soon you will be practicing your cha-cha while waiting in line at the coffee shop.

Prepare. Perusing the unending dance options in Sonoma County is like being in a candy store, but this time the candy is good for you! If you are thinking about starting with something simple, such as nightclub two-step, take a peek at some online lessons from Buddy Schwimmer, or check out a YouTube video on "NC2S." Start to get the idea for the dance in your mind.

When it's time to actually get moving, pick a structured class or try informal group lessons before a dance (my favorite). Call the teacher and ask about shoes. If you dance for 15 minutes without proper footwear, you will strain an ACL or start yourself on the road to crippling tendonitis. The teacher will tell you what you need. Start with what you have and modify with suede soles. But please don't put off getting good shoes until you are a "good dancer." Having steel-shank arch supports (for women), flexibility, cushion and support will save you. Look up "anatomy of the dance shoe" online to learn more. Your shoe has gotta have sole with just the right amount of friction to allow a good spin without causing a slip. Here is where you can put your physics to work, as you think about dance.

Go to class. Show up 15 minutes early to catch the folks getting ready. Observe the culture of the dance world. Learn some of the nuances of social contact and exchange. If you arrive early, you will be one of the first on the floor. Many dancers told me that they had danced before when young: ballet, tap, forced Arthur Murray lessons. Anything you learned in the past will come back in your first few lessons.

You may think each dancing style is unique, but you will soon see how they all overlap. The growing repertoire of dance steps is one of the reasons that dancing becomes so addictive. No matter what, resist the temptation to enter the intermediate dance class. Start at the beginning with the beginners. Remember it takes a year for a square dancer to learn enough calls to move up to the next level! The same is true for many other dances.

Stay late and reap the benefits of dance. Stay for the dance after the lesson. Here is where you really become a dancer. After a month of dancing up to 5 hours a week, you will be changed. As you increase your physical endurance, you will progress from being out of breath and dizzy after one lesson, to quickly "dancing the night away." If you are like most dancers, you won't even notice the change in your physical and emotional well-being unless something keeps you from dance. The dancers who responded to my survey wanted you to know this:

> I'm not much of one for exercise such as a treadmill, for sure, so dancing helps me stay active. It's very common to see a new dancer who is carrying more weight than they need, and watch the pounds leave as they exercise regularly. Perhaps the emotional benefits moderate some of the emotionally driven eating.

Dancers want you to know that it is never too late to start!

> My wife and I dance at least once a week. We are in our early eighties. At first, she was finished after the second set and wanted to go home to rest. Even at that, she sat out a goodly number of dances. After a year she was good for four sets and hardly ever sat down. Me? I can dance all night.

Open new doors and end social isolation. Dance is a doorway to social fitness as well. We already know that isolation can lead to mistreatment and elder abuse, domestic violence, and acting out. Isolation in all age groups has been proven to increase rates of depression and suicide. Dance is armor in the battle against isolation. While you

learn to dance, you learn the language of dance, how to communicate without a sound. These are skills that can blast depression right out of your life:

> At that time in my life I was feeling very sad & depressed, and like a duck out of water. I was also somewhat shy. What I soon learned was that when I was dancing, I was smiling and laughing and having a grand time. For that space in time, the sad part of my life was a thousand miles away, and having time away was very healing for me.

Dancing can bring out old injuries, but the stretching and strengthening can often sooth stiffness and the depression that comes with chronic pain. A person with chronic physical pain may find the only time they are truly free is when they are so caught up in the dance the pain does not matter:

> A few years ago, I began to have a kind of grinding pain in my hips, making getting out of bed in the morning a little difficult due to stiffness and soreness. Sometimes, when I went to Monroe and started my first few dances, I was in so much discomfort and pain that I felt I might fall down …What happened, I found, was that the first few minutes of dance were painful and trying, but that endorphins soon kicked in, the smiling and laughing began, and the pain went away.

Over and over, one of the most important messages that dancers wanted me to convey was: *You do not need a partner to dance!* Our culture is partner-based, even if we do not want to admit it, even if we struggle against it. But you do not need a partner to dance! If you are out on a lively dance floor, and focusing on everything but yourself, feelings of isolation and loneliness can dissipate in a single twirl.

Immerse in the culture. I started dancing in my teens, as an exchange student in Costa Rica. As I learned how to dance the bolero, salsa, merengue and cumbia, I learned Spanish: *Quieres bailer? Vamos! Swing criollo!* I soon discovered that Ticos (Costa Ricans) danced, a lot. In the small town where I lived, dances were held at two or more dance halls, Thursday through Sunday. If you wanted to assimilate and acculturate, you had to dance. I walked and danced so much, it wasn't long before my clothes were hanging off me. Dancing was my entry into Central American culture and the Spanish language.

Traditional group dancing can be a bittersweet path leading through an entire history of cultures within cultures. It is an honor to join Eritrean, Greek, Palestinian, Roma, Japanese, Israeli, Mayan and many other culture-specific group dances. These dances usually involve physical contact or simple eye contact, and they unite people in ways that are lost in modern culture. We can share through dance at many of the local festivals in Sonoma County:

> If one is grieving over a divorce, it is a great comfort to go Israeli folk dancing. Somehow the music, and the story of the dance, and the movements are a comfort. Especially the circle dances help take some of the pain away for a while, for an evening.

Lucy Whitworth sounds like a very young woman over the phone. As a member of the Redwood Rainbows Square Dancing Club, she has been expecting my phone call and has been doing some research of her own: "Oh, here it is: Square dancing for one hour is equivalent to a three-to-five mile walk! I thought that was good! But it is so much more than that. It is such a good workout for the brain!"

Lucy started square dancing when she was 68 years old. Nine months through the required 12 months of learning, she was diagnosed with breast cancer. She credits her dancing with her quick recovery and social support:

> After nine months of dancing, I was in really good shape, but then it was a year and a half before I could get back into dancing because I went through the whole thing: mastectomy, radiation, chemo. Dancing was the thing that really brought me back. The community welcomed me back. I really credit square dancing with my passage through such a grim experience.

Sonoma County is a hive of dancing activity, from folk to competitive West Coast Swing, hip-hop to ballet, jitterbug to the blues, and even steampunk-ready burlesque. What are you waiting for? ◇

Email: foysterling@comcast.net. *My thanks to Steve Luther and all the dancers who wrote to me.*

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Sonoma County Dance Halls

A selective list, in alphabetical order.

Coco's Club. 21 Fourth St., Petaluma. A Central American night club, right here in Sonoma County.

Ellington Hall. 3535 Industrial Dr., Santa Rosa. Where to go on those Friday nights when you feel young.

Flamingo Resort Hotel Lounge. 2777 Fourth St., Santa Rosa. West Coast swing, salsa and bachata.

Monroe Hall. 1400 W. College Ave., Santa Rosa. The epitome of dance halls and the dance hall culture.

Petaluma Community Center. 320 N. McDowell Blvd, Petaluma. Classes in jitterbug swing, salsa and many more.

Russian River Brewing Company. 725 Fourth St., Santa Rosa. Where to go for a peek at the Rockabilly scene.

Sebastopol Community Cultural Center. 390 Morris St., Sebastopol. Many dance traditions are offered here, from morris to belly dancing.

Society: Culture House. 528 Seventh St., Santa Rosa. Home to Salsa Caoba.

The Ballroom. 977 Golf Course Dr., Rohnert Park. John Ross teaches a dance sampler class here.

Wischemann Hall. 465 Morris St., Sebastopol. Home to the Redwood Rainbows Square Dancing Club.

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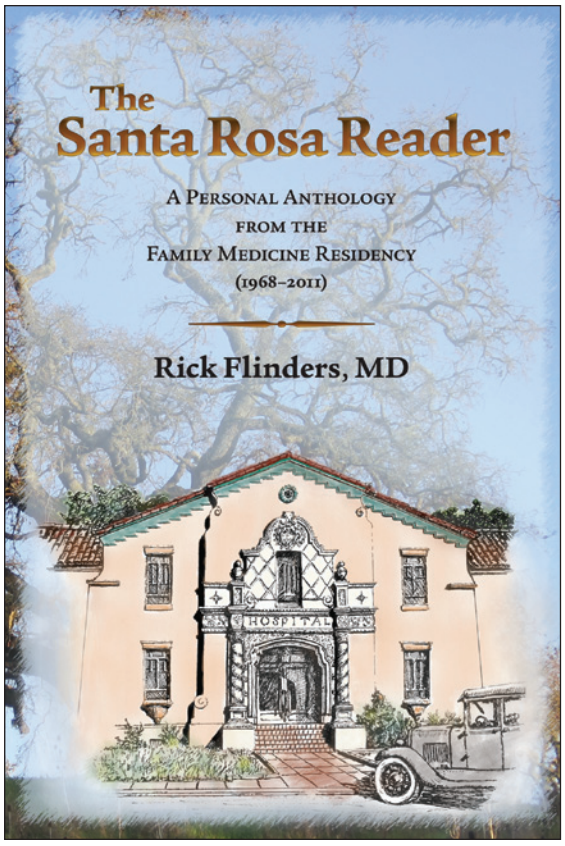
A Voice for the Generations

Scott Eberle, MD

The Santa Rosa Reader: A Personal Anthology from the Family Medicine Residency, by Rick Flinders, MD, Sonoma County Medical Association, 95 pages, $9.95.



Some artists' work speaks for itself. Some artists' work speaks for a generation.

—Jack Nicholson, introducing Bob Dylan at the first Live Aid Concert in 1985

I was on faculty at the Santa Rosa Family Medicine Residency from 1989 to 2001. A few years into my tenure, one of the faculty's more senior members told me that you could only be an effective teacher of residents for about 10 years out from your own training. "After that," she said, "you've forgotten what it's like to be a resident." At the time I vowed to never forget, and to stay beyond that 10-year mark. Turned out she was right: I left the faculty after 12 years of teaching. In the flow of residency time, it seems, a generation is about a decade long.

All the more remarkable, then, that Dr. Rick Flinders has been teaching at the residency for more than three decades. With the release of his new book, *The Santa Rosa Reader,* it becomes clear just why Rick has stayed and why he has continued to flourish—as physician, teacher and writer. Much like his great muse, Bob Dylan, Rick has reinvented himself over and over. The one constant is that he has been a leading voice for the Santa Rosa residency, generation after generation.

I mark the start of Rick's first "generation" of teaching as 1985. After five years of part-time faculty work, that was the year he became full-time director of the residency's inpatient medicine service. It's also the year he wrote "Hour of the Intern," the first essay in this anthology from Rick the practicing physician.

Clarion (1985–1995)

I know best this phase of Rick's teaching and writing career. We first met in 1983 at UCSF medical school. I was a fledgling medical student, he a fledgling faculty member. At this young age, I had an inkling of an idea about (or maybe it was just a longing for) what it might mean to be a physician. Rick was the first person to give me words to describe this youthful vision. During a small seminar for medical students, Rick offered story after story from his private practice in Petaluma. I can see now how, with each story, he was trying to bring to life the immortal words of poet and physician William Carlos Williams:

> [S]o for me the practice of medicine has become the pursuit of a rare element the patient may reveal at any time. It is always there, just below the surface. From time to time we catch a glimpse—and we are dazzled . . . it is magnificent, it fills my thoughts, it reaches to the farthest limits of our lives.

Some of the best essays in this anthology—"Prologue: First Patient," "House Call: What Doctors Learn" and "Epilogue: On the Road with Daisy Mae"—are stories that capture Rick's rare and dazzling moments. When he and I first met, he wasn't writing these stories yet; but in that small UCSF seminar room, he was already the consummate bard: Rick the storyteller, and me the rapt listener.

Dr. Eberle, a graduate of the Santa Rosa Family Medicine Residency, is a Petaluma family physician.

In addition to being a storyteller, the Rick of these times was also a clarion for a cause. That cause was (and still is) the family medicine movement. "The Quiet Revolution" (1989) is the quintessential expression of that call. Before reading the following excerpt, first check out the dated photograph on page 15. There you'll see seven long-haired or bearded faculty (all of them men!) and off to the far right is the youngest of them all: Rick with his nonchalant, cocky swagger. Listen for that same swagger in what he wrote:

> [W]hat better profession than medicine to fulfill the call to human service articulated by so many of the disenchanted? And what better specialty than family practice to bring to medicine a restoration of the values perceived missing from the profession? A personal physician, a caring physician, one who listens to you, who knows the rest of your family, who will "be there for you" when it counts . . .

Clarions can summon many a follower (as Rick did me), but they also risk being too loud and brassy for some to catch their melodic beauty. So here I also remember the many words I heard this same man speak in person—be they on morning rounds, in residency meetings, or especially one-on-one in his office. If his writings back then were often clarion-like, his spoken words were softer, quieter, yet equally self-assured. They offered great solace to a generation of young doctors struggling to live up to the high calling of family medicine.

Memories come flooding back, but none more important than the summer of 1989, just as I was transitioning from resident to faculty member. The nurses of Community Hospital went on a long painful strike that tore a gaping rent through the residency. Residents sided with nurses and faculty with the administration, which left me stark naked in between, unable to side with either. Many nasty words were spoken, and a few lost their precious jobs. At the darkest hour (mine, if not the entire residency's), I went to Rick's office—an office decorated by a photograph of Planet Earth and quotes and pictures from Albert Einstein, Mahatma Ghandi and, of course, Bob Dylan.

Dr. Flinders (in white shirt) with Dr. Catherine Gutfreund (holding book), Dr. Mark Netherda and Dr. Laurel Warner at the recent SCMA Wine & Cheese Reception *(see page 46).*

"Everything is now hanging by a thread," I pleaded to Rick, "everything that I ever believed this residency stood for. Unless you have something really good you can tell me, that thread is about to snap and I'm about to walk."

I leave Rick's response to the privacy of his office, but this much I will say: The thread didn't snap that day, and I stayed for 12 more years.

Night Watchman (1996–2005)

The 1990s were a tumultuous time for the residency (and for American medicine). If the '89 nursing strike was a great seismic shift opening a chasm within the residency, then many aftershocks soon followed. Over the next few years different people considered quitting, some were threatened with expulsion, and ultimately a few did go. Rick's saving grace was a sabbatical year in Japan. Upon returning, he stopped trying to do the impossible—bridge that great political divide—focusing instead on doing what he has always done best: teaching medicine.

It's not an accident that this second decade begins during a five-year writing silence from 1994 to 1999. It took an invitation from a graduating class of residents to again awaken Rick's voice. That voice and his stance—both before those residency grads and in the essays that soon followed—were different from the youthful swagger that had come before. In these middle years, he is clearest and most persuasive when he is serving as night watchman. The clarion sound is still present, but Rick is now alerting all physicians about darker forces threatening his beloved practice of medicine.

"Chimes of Freedom" (Commencement 1999) takes on the impact of big business on medicine:

> In the 1990s, perhaps the most profane acronym of all is spelled H-M-O. Is there anyone who really likes these things? They're bigger than phone companies, they merge more often than banks, and they're about as user-friendly as tobacco firms. . . . HMOs are not the enemy. But they are the most visible symbol of the for-profit corporate tidal wave that has swept over American medicine.

And in "Apprehending the Elephant" (2002), Rick takes a broadside shot at the pharmaceutical industry:

> Can we place our faith in randomized controlled trials if those trials are virtually controlled by the company that makes and sells the drug? And, while we all applaud the access of our patients to more health information, do we really want that information to come from the

same television advertisers who write copy for cosmetics and breakfast cereal?

A common theme ties this section of the anthology to the more idealistic essays that precede it. When addressing the 1999 graduates who were about to be swallowed up by the great techno-beast of corporate medicine, Rick urges them to learn how to "tell time," which means for him "to care."

> No, we're not asking you to go out and save the world. We're only asking you to go out and care for it—one patient at a time. Caring is the one thing—perhaps the only thing—that endures.

Even in this dark time—especially in this dark time—Rick the night watchman is still tending the flame.

Savior (2006–2012)

In the first section of *The Santa Rosa Reader,* Rick writes as a voice for a young generation, proclaiming the unique promise of family practice. In the second, he cautions an entire community of doctors about the dark forces of profit-driven medicine. By the third, the very future of his beloved residency is threatened by those forces. Here we come to the most important essay of the entire anthology: "Residency at the Crossroads" (2006).

Rick begins the essay by recalling the long and storied tradition of the residency. "The ultimate measure of the quality of our program," he suggests, "is the quality of the physicians we produce." He then offers a roll call from the generations: just a few exemplars of a much longer list of graduates. This essay is not merely about looking back, but about also taking stock of the present and looking to the future. Rick offers a sobering account of how "the health economics of Sonoma County are unique and doubly cursed," and how this curse directly threatens the continued existence of the residency. Somehow he still offers a reasonably upbeat conclusion:

> I've intentionally called this moment in our residency's history a "crossroads": an intersection, a scenario that implies choices. I'm asked daily if our program is closing. My answer is no. This is not the end of a road. We have options . . .

Don't be fooled by Rick's optimism here (as Rick's friend I can say that one of his most endearing traits is how he forever sees the proverbial glass as half-full). If the residency had reached a crossroads in 2006, then one of the more obvious roads ahead fell precipitously off a steep cliff.

It is not an accident that the only time Rick ever assumed the role of residency director was during this cataclysmic year. He had always been (and still remains) the consummate teacher of family medicine—not an administrator or politician. And yet he was the one person who had engendered enough trust of others—not merely faculty members, residency graduates and current residents, but also administrators and politicians—to steer the course of the residency in this most dangerous of times. During generations of teaching, Rick had written, spoken, taught, and modeled a path of true integrity. Finding a way forward for the residency—nothing less than a collective path of true integrity—fell upon his shoulders, a burden he then wisely shared with the Steering Committee for Residency Redesign.

Ultimately that committee would succeed. The residency would be saved, and the lineage of Santa Rosa-trained family physicians would continue. The rest of this anthology reads as a footnote to that great success.

Early on in *The Santa Rosa Reader,* Rick tells his readers, "This is just a little book, but it owes its life to a lot of people." He begins by citing three teachers who were "giants in our tradition of teaching at Santa Rosa": Jim Gude, John Dervin and Lou Menachof. Add to that Mount Rushmore list a fourth: Rick Flinders. If you want to understand why, read this book. Read it and then locate your own place in the greater story: the story of a "quiet revolution" that continues to this day, in spite of forces that might have it be otherwise. ◇

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BOOK EXCERPT

[Editor's note: The Introduction to the Santa Rosa Reader *appears below.]*

Nestled among oaks and eucalyptus in the foothills of Santa Rosa, Sonoma County's oldest hospital has been training family doctors for over half a century. When family practice (now known as family medicine) became a designated specialty in 1969, Santa Rosa was already a fertile and natural training ground, and its general practice residency was among the first in the country to become accredited for family practice. For a new generation of graduates attracted to the culture of family medicine, Santa Rosa became an Athens. I got there in 1977, awestruck by the residents who trained there and the family physicians who taught them. I've been there ever since.

The selection of writings for this book spans over forty years. While the book traces the local story of the Santa Rosa Family Medicine Residency, it also tells the larger story of family medicine. The early pieces mark my route to Santa Rosa and into family medicine. In the prologue, for example, I relate how and where I met my first patient, long before I was ever a doctor. "Quiet Revolution" speaks to the historical and cultural roots that spawned our specialty and drew many of us into family medicine during the 1960s and 1970s. Later pieces, like "Residency at the Crossroads," "Crisis of Faith" and "Family Medicine as Counter-Culture," speak to the present dynamic moment in U.S. health care: transformative reform vs. colossal missed opportunity. In between are essays, editorials and reviews that provide temporal landmarks in the history of our specialty. Mostly they offer glimpses into the extraordinary process of training, teaching and becoming family physicians.

Wine & Cheese Reception

Entry to the Williams Selyem Winery

Dr. Ed Chang, Raafia Chang, Dr. Margaret Marquez

Jeffrey Scharfen, Dr. Cindy Scharfen, Dr. Charles Elboim

Dr. Loie Sauer, Dr. Robert Nied

Dr. Janet Pulskamp, Dr. Regina Sullivan

Dr. Susan Logan, Boback Emad, Dr. Lela Emad

Dr. Cuyler Goodwin, Cynthia Melody

Dr. Jackie Senter, Dr. Lela Emad, Dr. Susan Logan, Dr. Loie Sauer

Outgoing SCMA President Dr. Jeff Sugarman

Dr. Sugarman handing SCMA gavel to Dr. Mills

Incoming SCMA President Dr. Walt Mills

Jennifer and Adam Krouse (medical student)

Greg Chatfield, Dr. Catherine Gutfreund, Dr. Charles Meltzer

Dr. Brad Drexler, Pam Drexler

Elizabeth Mills

Pamela Loman, Dr. Jill Zechowy, Dr. Mark Homicz, Dr. Michael Lustberg, Denise Lustberg

Dr. Margaret Marquez, Dr. David Vidaurri

Photos by Will Bucquoy.

The 12th annual SCMA Wine & Cheese Reception was held at William Selyem Winery west of Healdsburg on Wednesday evening, May 30, a picture-perfect end to a glorious Sonoma County spring day. Nearly 100 SCMA members, spouses and guests attended the event, which included a ceremonial passing of the SCMA gavel and brief remarks by the outgoing president, Dr. Jeff Sugarman, and the incoming president, Dr. Walt Mills.

Nominations Needed for SCMA Awards

SCMA is seeking nominations for its Outstanding Contribution and Recognition of Achievement awards, to be presented at the medical association's annual dinner this fall. Nominations are needed by Sept. 17 for all four awards listed below:

Outstanding Contribution to the Community
Presented to an SCMA member whose work has benefited the community

Outstanding Contribution to Local Medicine
Presented to an SCMA member who has improved local medical care

Outstanding Contribution to SCMA
Presented to an SCMA member who has served the medical association beyond the call of duty

Recognition of Achievement
Presented to a nonphysician who has helped advance local medicine

---

Use the following form to offer nominations for the awards. Visit www.scma.org/resources for a list of past recipients.

- Outstanding Contribution to the Community

- Outstanding Contribution to Local Medicine

- Outstanding Contribution to SCMA

- Recognition of Achievement

Nominations must be returned to SCMA by Sept. 17. You can:

- **Fax** to **525-4328**
- **E-mail** to **cynthia@scma.org**
- **Mail** to SCMA, 2901 Cleveland Ave. #202, Santa Rosa, CA 95403

Questions? Contact Cynthia Melody at 525-4375 or cynthia@scma.org

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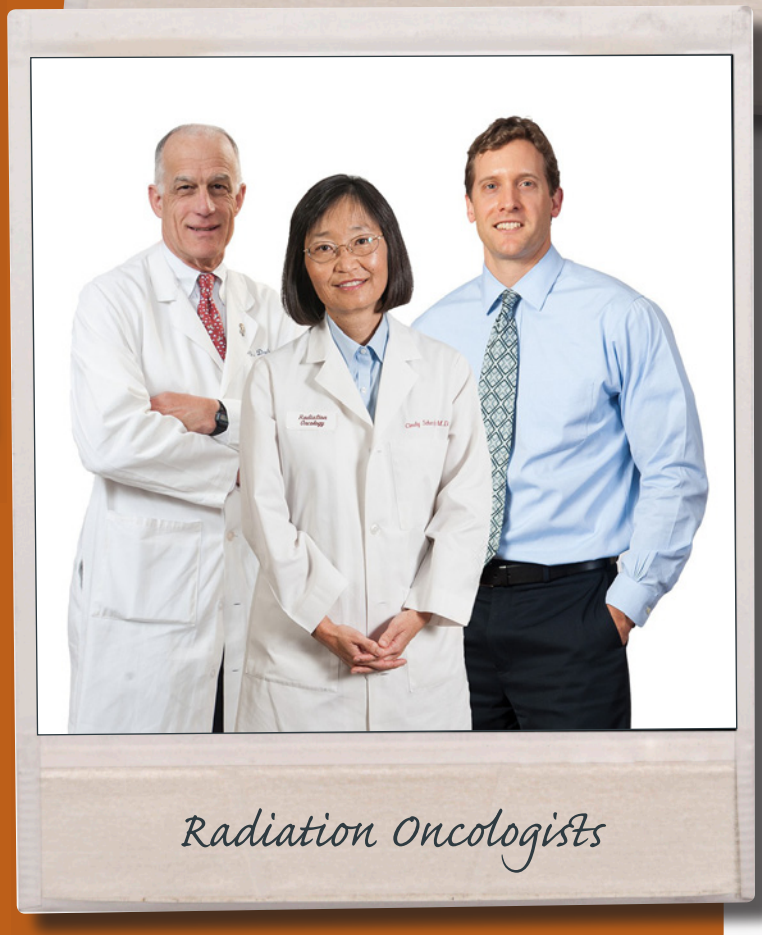

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* Physicians Insurers Association of America Risk Management Review: 2011 Edition.

**Jena et al. Research Letter, Online First: Outcomes of Medical Malpractice Litigation Against U.S. Physicians. *Archives of Internal Medicine*. May 14, 2012.

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